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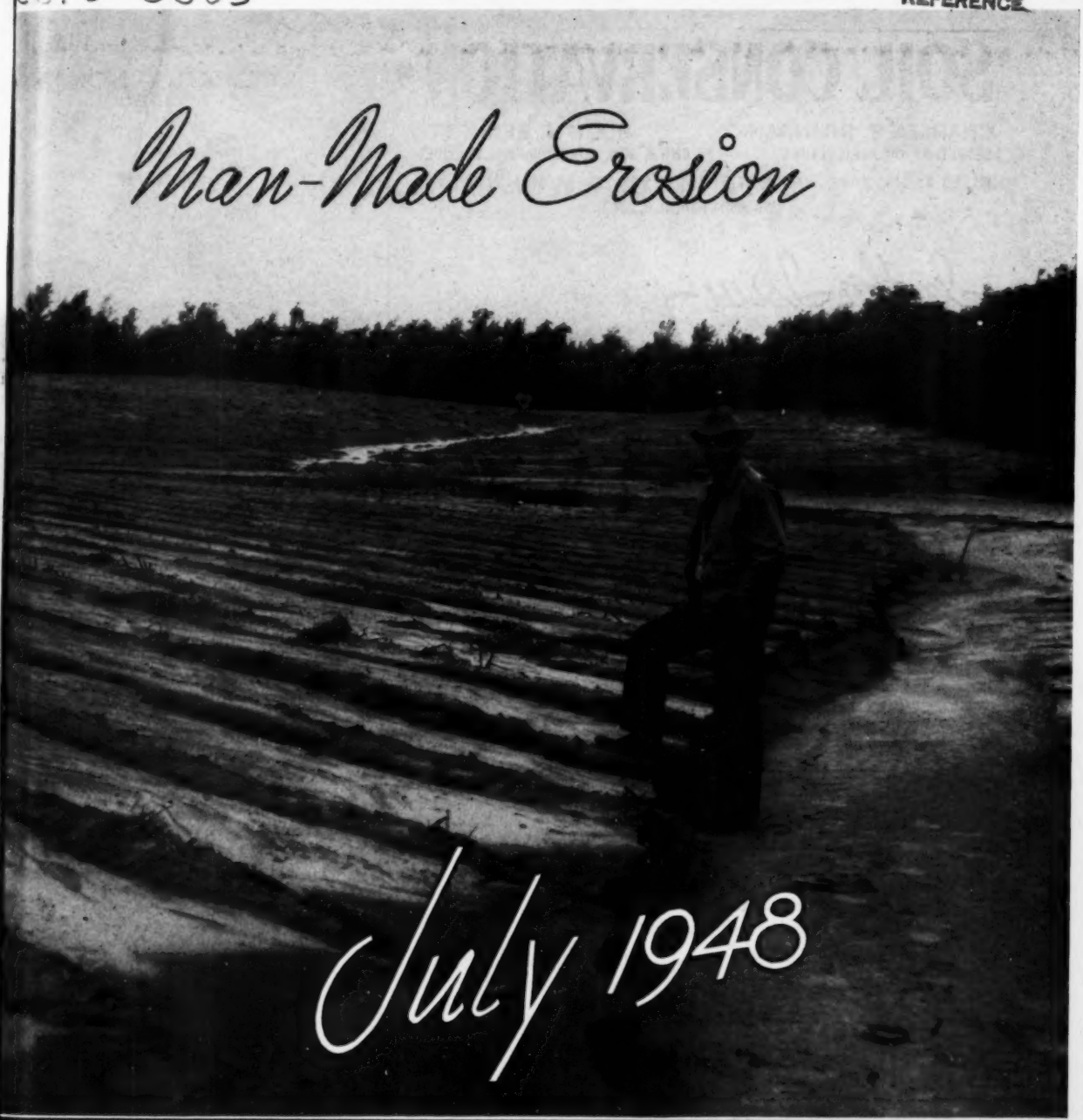

SOIL CONSERVATION

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SECRETARY OF AGRICULTURE

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In this Issue—

	Page
THERE'S CASH IN THOSE WOODS By Herb Boddy	251
ONCE-FLOODED LAND YIELDS BUMPER CROP By Marion H. Weaver	253
LIVE SOILS ARE RICH IN HUMUS By Grover F. Brown	255
THEY PUT A HALTER ON OL' MAN RIVER	257
SOIL EROSION IN SCANDINAVIA By Vernon Hahn	260
THIS EARTH IS OURS A review by William A. Albrecht	264
REPORTS FROM THE DISTRICTS	
Northeast	264
Southeast	265
Northern Great Plains	266
Western Gulf	267
Southwest	268
Pacific	270
RESEARCH POINTERS Prepared by J. H. Stallings	271
MAGAZINE IS "TYPE OF HELP WE NEED"	272

WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with approval of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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OUTDOOR LAB.—Dates for the Ohio Conservation Laboratory are June 21 to July 28. Place is Camp Muskingum, at Leesville Lake in Carroll County.

The "laboratory," which has been held each summer for several years, aims at combining study and recreation in outdoor surroundings. It offers to school teachers, college juniors and seniors, and others a 5½-weeks conservation course sponsored by The Ohio State University in cooperation with the State Department of Education and the Ohio Division of Conservation and Natural Resources. The University allows for completion of the work 8½ quarter-hours of graduate or undergraduate credit. Considerable attention is given to soil and water conservation, and it is a practice to visit the local soil conservation district.

Charles A. Dambach is director. Inquiries should go to D. H. Eikenberry, chairman, Department of Education, Ohio State University, Columbus 10, Ohio.

FRONT COVER.—After a single 5-hour rain, these lister furrows were filled with eroded soil to a depth of 2 inches or more. Some of the furrows washed out completely to a depth 12 inches below the adjacent ridges. If this serious erosion is allowed to continue at the present rate, the field will be of no further value for practical cultivation by about 1960. A sound conservation program would protect it and keep it in production. The photograph was made in Cottle County, Tex., in May 1947.

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There's Cash IN THOSE WOODS

By HERB BODDY

Changing from "cut as you go" to "crown thinning" put R. C. Heilman in line to cash in on the lucrative rough lumber market in northwest Washington. Here he measures a fallen second-growth tree marked for harvesting under his selective-cutting plan.

PASS LAKE, a mere dot on the map and long a haven of anglers, has achieved new distinction as the center of a teeming farm woodland milling industry.

A chugging, pocket-sized sawmill, cutting rough lumber at the rate of 2,000 feet daily, is noisily changing the stark quietude of the forested watershed near Deception Pass State Park, in Skagit County, Wash.

Resourceful, conservation-minded E. C. Heilman, Seattle plumber, who played a hunch and switched to lumbering 4 years ago, has found in his 560-acre timber holdings an opportunity to mix pleasure with business.

A member of the Skagit Soil Conservation District, Heilman is doing double duty as lumberman and cattleman on his ranch 9 miles south of Anacortes. But his biggest stock in trade today is his interest in logging 500 acres of woodland the conservation way.

When Heilman purchased three-fourths of the timber surrounding Pass Lake, in the spring of 1943, he was, as he says, "green as grass about the logging business."

"I put my money in trees," Heilman explained. "I figured logging was my best source of income."

He bought a bulldozer, started felling, barking and yarding his timber. Mount Vernon and Anacortes mills took all the logs he could haul. With building booming, Heilman's logging enterprise began making money from the start.

After 2 years of logging his old stands, Heilman began to wonder whether he wasn't cutting the frosting off his holdings.

"It occurred to me," he points out, "that I couldn't make money year after year off my holdings, cutting logs at random. I figured there must be a better way."

Heilman talked things over with the supervisors of the Skagit Soil Conservation District. The governing body turned over Heilman's case to technicians of the Mount Vernon office of the Soil Conservation Service.

Bill Tinney, forester, and Austin Summers, field technician, went over the acreage carefully with Heilman. By changing his logging methods to a sustained yield basis, it was shown that Heilman's timber holdings could be made to produce more profitably under a long-range program of woodland management.

NOTE.—The author is an information specialist, Soil Conservation Service, Portland, Oregon.

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Heilman, once a Seattle plumber, at work in his mill. Two thousand feet of rough lumber are produced daily.

As the first step, Heilman set up a 5-year test area. Service field men marked the trees for selective cutting. Instead of felling the smaller trees first, as he had been doing, Heilman tried logging out his biggest firs and cedars.

The system, known as crown-thinning, opens up the woodland, giving more growing room for smaller, immature trees.

By year's end, Heilman's small trial area worked out so well that he decided to put his entire 500 acres of woodland on a sustained yield basis. Then, convinced it was time to branch out, he bought a sawmill for $6,000 and began rough-sawing his logs for market.

Besides the 2,000 feet of rough lumber milled daily, Heilman has found a ready market for several forest by-products. His sawdust is sold as hog fuel and bedding material. He markets his slab and other waste timber in nearby towns for fuel and stovewood. Summer home dwellers buy his bark for their fireplaces.

But Heilman will gain other benefits from his use of woodland management methods. By controlling the cutting of timber, he will provide a protective cover for the Pass Lake watershed. If his holdings had been clean-cut, logged off and burned, he would have been troubled by both soil and water losses.

Runoff on a barren watershed is heavy, and usually is accompanied by serious soil damage. With little vegetative cover, the natural fresh water springs, which comprise the main source of supply of Pass Lake, would run dry in summer. Now that he has his farm conservation plan in full swing, Heilman can "farm" his tree crop, and at the same time practice soil and water conservation.

On off days, Heilman lays aside his logging outfit for the plow. Of the 60 acres now under cultivation, 30 were cleared by Heilman the last 3 years. His plan calls for clearing 100 more acres for hay and pasture this year and next.

As a cattleman, Heilman is no "boots and saddles" rancher. In plumber's attire, he is dressed for lumbering or stockraising. His present herd of six polled herefords will be increased to 40.

Summing up his beef cattle venture, Heilman said, "I'm counting on my beef stock to open a second crop production front for me. I believe it will boost my income from lumbering considerably."

For recreation, Heilman expects to do a little fishing on the side, when Pass Lake opens again. It's just two jumps and a scamper from mill to lake.

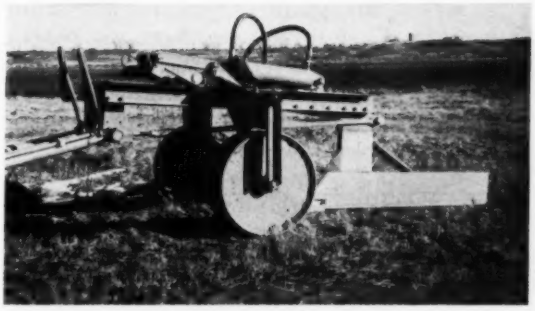
ONCE-FLOODED LAND YIELDS BUMPER CROP

By MARION H. WEAVER

IN 1921, more than a quarter of a century ago, the Arkansas River went on a rampage in Southeastern Colorado. When the floodwaters subsided, 52 acres of what is now the Ryan brothers' 400-acre farm, 3 miles northeast of Rocky Ford on the north bank of the river, were covered by 2 feet of sand and gravel. Productivity was considered destroyed, and, as years went by, a dense grove of cottonwood trees grew over the debris.

In the summer of 1946, the owners, James Ryan, his son Millard, and three nephews, Ted, Phil, and Fred, became interested in a soil- and water-conservation program for their land. They entered into an agreement with the East Otero Soil Conservation District and received the aid of Soil Conservation Service technicians in planning their program.

In an effort to restore the 52 acres of flood-ruined land to profitable production, a bulldozer was used first to uproot the trees; many of them were used as riprap to protect the river banks. The Arkansas River forms the south and west boundaries of the field. Next, the technicians planned for the leveling and the installation of an irrigation system. After carry-alls had been used for the heavy dirt-moving, a landplane owned by the district was used to finish the leveling job. Then a well was drilled and an electrically operated pump installed to provide irrigation water.



This 30-inch moldboard plow was used to mix the flood debris with buried topsoil.

Finally, since the soils survey had shown that the original moderately heavy soil had been covered by around 2 feet of sand and gravel during the 1921 flood, a 30-inch moldboard plow was used to mix the buried topsoil with the covering debris.

The 36 acres in the southwest portion of the 52-acre field were planted to corn in 1947. The yield averaged 60 bushels to the acre. The remaining 16 acres, being more sandy, were seeded to sweet clover with a nurse crop of oats. This will be turned under for green manure.

NOTE.—The author is district conservationist, Soil Conservation Service, Rocky Ford, Colo.

Ryan orchard produces large variety. Crops are in rotation, with frozen cantaloupe balls marketed as a specialty.

The cost of clearing, leveling, and installing the irrigation system on the 52-acre field was approximately $5,000. Returns from the first year's crop on 36 reclaimed acres approximated $4,000—about 80 percent of the entire investment.

In carrying out a soil- and water-conservation program on the entire 400-acre farm, the owners will follow a crop rotation of small grain, corn, cantaloupes, and onions with sweet clover for green manure. Some sheep are kept and the manure is being spread on the cropland in addition to commercial fertilizers.

Three excellent spring-fed ponds have been developed on the north end of the farm, and have been stocked with fish. Immediately adjacent to the ponds is an orchard which produces a wide variety of fruits and consequently attracts many species of birds. The fish pond and orchard area provide an attractive spot for sport and recreation.

The Ryan brothers' farm is one of the larger producers of quality cantaloupe seed in the Arkansas River valley, these being sold widely over the United States. In 1946, Phil Ryan organized the Rocky Ford Food Products Co., which specializes in the production and wholesaling of frozen cantaloupe balls. This product is proving very popular with hotels and restaurants and several carloads have been shipped during the last 2 years.

INTER-AMERICAN CONFERENCE.—The Government of the United States, at the request of the Pan American Union, will serve as host to the Inter-American Conference on Conservation of Renewable Natural Resources, to be held at Denver, Colo., during September 7–20, 1948. This conference, the first international meeting of its kind on conservation, is for the purpose of considering problems involved in the conservation of renewable natural resources in the Americas, and to discuss recent technical developments on this subject. It is being organized pursuant to a resolution adopted at the Third Inter-American Conference on Agriculture held at Caracas, Venezuela, in July 1945.

Among the problems to be discussed will be those arising out of deforestation, soil erosion, overgrazing, wildlife destruction, floods, and failing water supplies.

The conference will consist of a series of meetings to discuss conservation problems, together with field trips to study land management practices. The delegates will have an opportunity to view at first hand soil conservation districts, forest and range experiment stations, the Rocky Mountain National Park, and other places of interest. Irrigation projects will be studied, along with their relationship to agriculture, grazing, and forestry practices on the land from which irrigation waters are derived.

> . . . to the Four Allies are opened the gateways of an opportunity to bless the whole world as never before. Beyond the murk and rubble of the war; beyond the last, bleak resting places of millions of heroic men; beyond the razed homes and shattered towns of 'the quiet people'; beyond the scorched acres and barren fields; beyond the famines and their reign of death; beyond all this horrible orgy of life-destruction, is seen the vista of the living earth as the source of the reconstruction of terrene mankind. At the gateways stand sentinels awaiting the password—THE SOIL."—From "Reconstruction by Way of the Soil" by G. T. Wrench.

Although the conference will be a technical one with no power to negotiate agreements, it will consider national and international action for the conservation of renewable natural resources and their optimum use on a sustained-yield basis.

The working sessions of the conference will be divided into sections corresponding to the sections of the program. One of the sections, "Renewable Resources and International Relations," will be led by Ernest Holt of the Soil Conservation Service.

DEATH OF ALDO LEOPOLD.—On April 21, while fighting a grass fire near his summer home not far from Madison, Aldo Leopold, 62, professor of wildlife management at the University of Wisconsin, died of a heart attack.

Leopold was best known, perhaps, for his contribution to wildlife management. His "Game Management" published in 1933, has never been superseded as a textbook in this field. His many other publications, both technical and philosophical, have added dignity and stature to the wildlife management profession. Trained in forestry, Leopold was also well known in this phase of conservation, especially for his work in the Southwest, where he spent many years.

His interest in soil and water conservation was significant. In 1921 he wrote, in the *Journal of Forestry*, an article calling for erosion control as a part of forest policy. In following years he wrote other articles on forest erosion control, and in 1924 he made an erosion survey of the National Forests of the Upper Gila. He was one of the first to point (in 1931) to the value of erosion control operations for improving habitat conditions for wildlife.

Leopold was the recipient of the Hornaday Medal for Distinguished Service to Conservation, the Outdoor Life Gold Medal, and other honors. In 1934, he was appointed to the President's Special Committee on Wildlife Restoration.

Aldo Leopold's sound thinking, his brilliant writing, and his personal influence have made a permanent mark on American conservation.

SOIL EROSION AND GRAPES.—Soil erosion is responsible in many instances for the prevailing differences in characteristics of surface soil in a given area, state R. B. Alderfer and H. K. Fleming, SCS research, State College, Pa. The extreme variability in productivity of different vineyard plots studied was very closely associated with the soil characteristics as they varied from one plot area to another.

LIVE SOILS ARE RICH IN HUMUS

An Agronomist Chats About Farming With Some of His New England Friends

By GROVER F. BROWN

ACCORDING to the 1946 issue of Agricultural Statistics New Hampshire's 1934–43 average production of commercial truck crops was about 2,000 tons. This production represented a farm value of some $36,000, which was equal in value to the same crops produced by the State of Kansas and over five times the value of the commercial truck crops for processing in Arizona. So, you see, the size of a State isn't everything and New Hampshire has some thing to make up for its lack of size.

The State's apple production for the same period was 733,000 bushels marketed. Of course. bad luck dropped the production way down in 1945, but the higher price received made up much of the difference. That is still about as many bushels of apples as Kansas produced, and about three times the number of bushels produced in the great fertile State of Iowa.

If you are planning to set out a new block of fruit trees or increase your acreage of truck crops, one of the first things I would suggest is that you look at your soil. Once you plant your apple trees, they should be there for the rest of your fruit-growing life. You can shift your vegetable acreage around to better soils if you have any, but you can't move your orchards from field to field every year or so. You can now get from the Soil Conservation Service, through your local soil conservation district, a land use capability map of your farm. This map will show you what kind of soil you have in each field on your farm, and the capabilities of your soils to produce permanently under a conservation system of farming. It will also give you a lot of other information, such as the depth of your soils, both topsoil and subsoil; the drainage conditions both on and in your soil profile, and the kind of a root zone your trees or vegetable crops are going to have. Therefore, my suggestion is, don't do any new planting without getting all the available facts about your soil. Maybe you can't acquire any other land than you now have, but you should know what is on and below your soil's surface, so that you can understand what your future soil-management problems will be. This service is free, so don't fail to take advantage of the opportunities available through your soil conservation district.

In setting out a new orchard on sloping land where run-off is likely to be a problem, it is well to look closely at your tree layout. Contour planting, with of course a complete water-disposal system, should be the primary consideration after selection of soil and site. Contouring is being accepted by growers who fully understand the benefits. They also fully understand some of the disadvantages of contour planting, but when they total the score sheet the advantages outweigh the disadvantages. It is generally true that you can't get something for nothing. You can't farm steep lands without its costing you something, even though you make a good return on your investment. Contouring is not a new practice in agriculture; it is almost as old as agriculture itself. If the practice were not sound it would not be used wherever agriculture is sound and permanent. Here again, your soil conservation district can arrange for technical service from the Soil Conservation Service.

Wherever there is soil erosion, the land is being misused. Erosion in itself is an admission that we are not treating the land right. If you saw a horse or cow starving to death in a lot with no feed you would feel badly because they were being mistreated. When you see land that is poor and starving, you feel badly, too. To mistreat land is even worse than to mistreat animals. Badly treated land can mean sure death to animals, men, and nations.

Once you have gathered the facts about the capability of your land; have determined varieties, and method of planting, and disposal of surplus water, you come to the most important factor in making a soil really productive. This factor is organic matter. I know that all of you are aware of the importance of the organic content of a soil. But maybe you haven't gone quite far enough in this direction.

We don't really know what we could do with a mineral soil of say 8 or 10 percent organic mat-

NOTE.—The author is Chief, Agronomy Division, Soil Conservation Service, Washington, D. C.

ter. With even half that amount we would be better off than most fruit and vegetable growers. In fact I doubt if the average commercial vegetable grower has over 2 or 3 percent organic matter in his soil.

We who are working in soil conservation know that if our soils have the proper structure there is a chance to get free water movement, both into and through the soil. If the structure is lost, and the soil runs together like cement when it is wet and cracks open when it is dry, there is not going to be a big fruit or vegetable crop. It has been said that when we lose the proper size of soil aggregates we have lost soil's productive powers. Of course, soils vary all the way from the silts and clays to coarse sands in sizes of particles—but a plentiful supply of organic matter can improve the structure of any mineral soil.

Mineral soil full of organic matter, or humus, is live soil. The soils that produce our best crops are full of bacteria and other soil organisms essential to fertility. I don't think we know how valuable a heavy organic content can be. I know of no experiment station that has a test to show what can be done with a mineral soil of 8 percent organic matter as compared with one having only 3 or 4 percent. We have thought that perhaps 3 or 4 percent is all that we need or can have under practical farming conditions. We haven't tried to find out what can be done with a soil full of humus, irrespective of cost. We have taken the position that the cost would be too high, and let it go at that. We may have an experiment station in New England that has some real data on how to maintain a mineral soil at anywhere near 8 percent organic matter but I doubt it. If we had, I'm sure the result on crop yields, to say nothing of the quality of those crops, would have been so high that we all would have heard about it.

There has been a lot of talk about getting more organic matter into the soil, but our research hasn't yet told how to do it. Sure, we recommend the growing of cover crops, and with apples here in New Hampshire we can do that in continuous sod. But how about our vegetable and crop farmers? After you take off a crop of late vegetables you don't have very much time, if any, to get a cover crop started before cold weather. Some way or other we must contrive to go farther than the growing of annual cover crops, or increasing the length by a year or so of the hay in the rotation. We need information as to how to make compost materials out of wastes, where to get more of such materials, and what value such materials can be to our soils and to our crops. Let's get the facts. Once armed with the facts, it should not be difficult to determine the price we can afford. Such research will need to be on a broader scale than small plots or greenhouse and laboratory studies, but surely there must be some place in this big country of ours where field-scale research can be pursued.

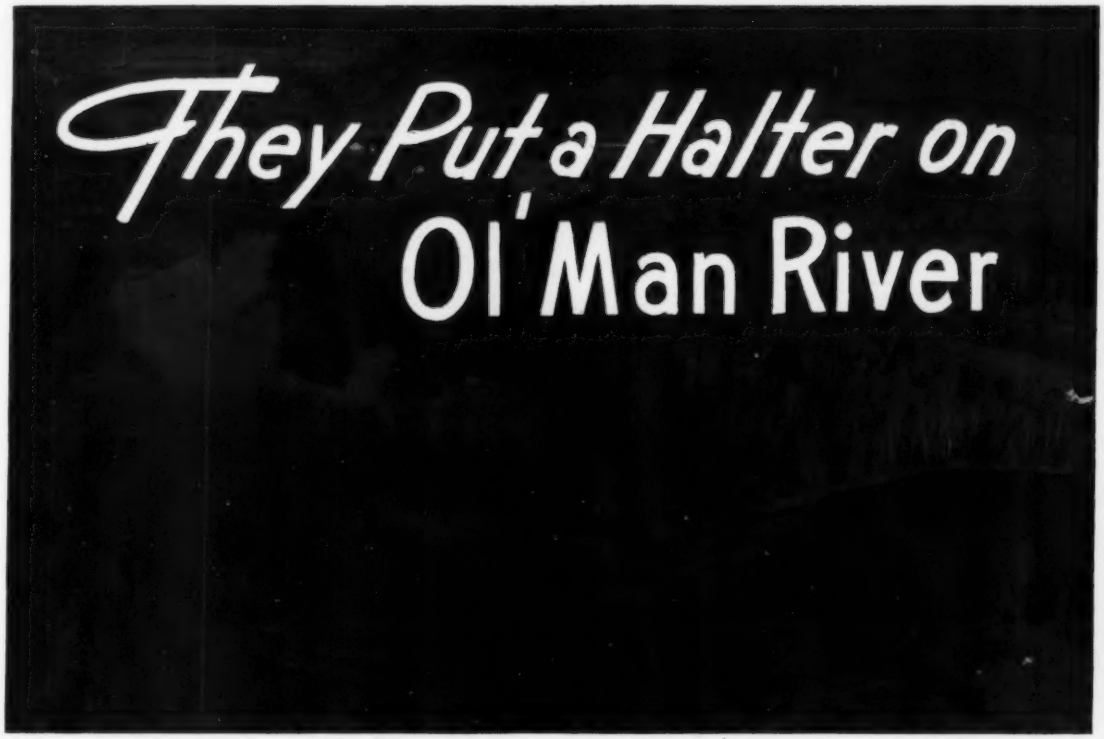
In the meantime, what more can we do with our cover and green manure crops? While an orchard is young, there is an excellent chance to work in a number of cover crops. If we inter-crop the orchard during these early years our opportunity for building up organic matter is gone, and our trees go into their fruiting stage in a soil poorly equipped to produce top yields. Here in New Hampshire we have a number of good legumes useful for soil improvement. Your choice will depend upon whether you want an annual like soybeans or cowpeas, or perennials like red and alsike clovers or alfalfa, and on the availability of seed. Ladino clover is excellent as a permanent cover crop and might very well be used with timothy or orchard grass. Such covers can be grazed a little if desired, or they can be mowed and left for mulch. It is sound practice to cultivate along the tree row for a few years, using the mulch produced in the middles for covering around under the little trees.

In any system of permanent covers or mulches, there is the mouse problem to contend with. By using poisons and by keeping the mulch from getting too close to the tree trunks, you should be able to handle this problem. For a short time after a dry mulch is placed in an orchard you will want to take precautions against fire, but there is practically no fire hazard in green or well decomposed mulches. Mulch should be kept on or near the surface. There's no need to plow a cover crop down under 6 inches deep. Feeder roots are near the soil surface when oxygen and fertility are plentiful. Deep disking or plowing serves to cut these feeders off and force the tree roots into less fertile soil layers in search of nutrients. Mow your covers and leave them on the surface. If you must use a disk, set it straight and run it lightly. It can be a damaging tool and do far more harm than you realize.

Commercial fertilizers carry recommendations

(*Continued on page 259*)

They Put a Halter on Ol' Man River



These jetties of wood piling, spaced around a sharp turn in Humptulips River, are designed to slow the flow and protect the adjoining farmland from bank damage. The swift cutting edges of the streams of Grays Harbor County, as they twist and turn through the countryside, present an awesome scene from the air.

IN THE GREEN DAIRYLAND bottoms of Grays Harbor County, Wash., alert farmers are putting a $1,500,000 halter on the rampaging, erosion-bent Chehalis river and its tributaries. Cracking down on one of the State's meanest soil "chiselers" is aimed at saving more than 65,000 acres of top farmland.

The current riverbank control program is a move by county, State, and Federal agencies, working closely with farmers, to mend Ol' Man River's ways. It is one of several postwar, soil-saving construction jobs on the timetable of the members of the Montesano-Oakville-Elma Soil Conservation District. Work now under way reshapes streambank control measures, developed up to 1941.

To protect the banks of farmland in the Chehalis Valley, 1948 style, a sum of $46,000 will be earmarked annually duing the next few years. Funds are supplied from the 1-mill county river improvement tax levy and State flood-control matching allotments.

Soil Conservation Service engineers estimate that from 50 to 100 acres of the county's best pas-

Leaders in river control: C. Tab Murphy, chairman, Grays Harbor county commissioners; G. H. Ridder, district conservationist; H. S. Swenson, chairman, Mountesano-Oakville-Elma Soil Conservation District; E. A. Lewis, work unit conservationist.

788506—48——2

The meandering Cowlitz River has cut deeply into the south bank of the Jacoby farm, near Toledo, Wash. Fifty-three acres have been lost since 1933. Five of the twenty acres lost in 1946 were of Class I, or top crop and pasture soils.

ture and crop lands are being washed downstream to the Pacific Ocean each year. The river bank erosion is heaviest between November and May when the swift-flowing Chehalis makes its deepest cuts in farm acreage along the stream's meandering course. Banks of several other Grays Harbor rivers, the Satsop, Humptulips, Wishkah, Hoquiam, and Wynooche, also considered highly erosive, are included in the plans.

Grays Harbor, with a 60- to 90-inch annual rainfall, is pointed out by G. H. Ridder, district conservationist, as one of western Washington's major river "trouble" areas.

Along the banks of the Chehalis, are many signs of the cutting power of the river's flow. Old landmarks are disappearing, as the river, turning and bending through the countryside, washes away huge chunks of crop and pasture land.

On a bend of the Satsop, which flows past the William Wharton farm, the river has etched a one-half mile notch from the rich bottomland and the waters are only 500 feet from the rancher's home site.

Grays Harbor's river bank project is being jointly developed by the Soil Conservation Service, the Washington State Department of Conservation and Development, and the Grays Harbor county commissioners. The farmer-managed soil conservation district is cast in a coordinating role.

Harry Swenson, district governing board chairman, who owns a 91-acre dairy ranch near Elma, described the movement as "the farmers' way of fighting river encroachment."

"We have to live with the river and its tributaries," he said, "so we're trying to get along together."

R. B. Miller, SCS engineer attached to the Chehalis district office, planned the structural features of the river-control program. Slowing down the river at the turns and protecting its banks from soil erosion will require construction work extending over a period of years.

River improvement work, now being carried out by county crews under the direction of Eric Anderson, includes construction of a series of jetties and abutments, plus a considerable amount of riprapping. Work includes both new structural projects and maintenance and repair of prewar construction.

Using bulldozer, and crane, piledriver and dragline, the crew of three to five workmen, under Anderson, is employed the year-around building new stream-control projects and repairing old soil-saving structures. Since the crew began its

work last June, it has tackled a total of seven erosion jobs, taking up each project in the order of its damaging effect on crop and pasture lands. Soil conservationists explained the increased amount of erosion of the county's rich dairy lands in recent years as being partly due to heavy logging of headwater forests.

Grays Harbor river-bottom lands produce nearly all of the dairy products which make up the county's agricultural backlog. The increasing importance of riverbank protective measures has established the erosion program on a permanent basis. Engineers of Federal, State and county agencies, cooperating in the work, pointed out that new construction jobs, such as building of jetties and stream-bank riprapping, will require year-long maintenance.

LIVE SOILS ARE RICH IN HUMUS

(*Continued from page 256*)

all the way from none to one-fourth pound of nitrogen, for each year of age of the tree, to 1,000 pounds per acre of a 2–12–6 or 3–12–12 or some similar mixture. Choice of fertilizer, and the amount, will depend more upon the quantity of humus than on any other single factor. Fertilizers and lime can be helpful in building up large quantities of organic matter, and in my opinion that is one of their greatest values. If you don't have a soil well filled with organic matter your chances of having a high-producing, long-lived orchard are pretty slim.

Certain fruit and vegetable diseases can be traced to low soil organic matter or humus. Prof. M. A. Blake, of New Jersey, has said that the application of one mineral nutrient alone, such as nitrogen, potash or phosphorus, fails to improve young peach trees that appear to be affected by "little peach." However, application of well-rotted manure or leaf mold has brought rapid recovery. This means only one thing, that the soils were so deficient in humus that a really healthy tree couldn't exist. A plentiful supply of humus in the soil will help keep your trees healthy. There are many similar examples of diseases in fruits and vegetables traceable to growing them on soils low in humus.

Poor drainage may be caused by a hardpan layer that prevents the free downward movement of water, or it may be the direct result of not having any place, such as a suitable outlet, for surplus water to drain away. Poor drainage sometimes is the direct result of poor soil structure. Sometimes poor surface drainage is the result of surface sealing caused by rain pounding unprotected land. This can be improved by keeping the land surface covered with growing cover crops, residues or mulch materials. A mineral soil kept high in humus is freely permeable to moisture, thus allowing for free entrance of water and free movement of water through and out of the soil. It is folly to worry about drainage and then disregard soil structure and the value of a high organic content. Removal of excess water is often a first necessity in wet soils but it is only one step. The real cure must include lots of organic matter and farming methods which continue to keep the soil full of organic matter. I'm sure you have all seen wet soils benefited by surface and tile drains. How many of those soils were high in organic matter? I'm of the opinion that most of the hillsides needing such drainage were very low in organic matter and that their agricultural value after drainage will stay low without adequate amounts of organic matter. You can get help from your soil conservation district on drainage but it is your responsibility to put organic matter into your soil and keep it at a high level.

In conclusion, may I say that attention paid to fundamentals such as capability of your soil, planning for safe disposal of surplus water either from your own land or any that may be coming from your neighbors, plus all the organic matter you can get before you plant a new orchard will largely determine your profits and length of life of your orchard. The Soil Conservation Service through your soil conservation district can tell you the capability of your soil for orchard or vegetable purposes. We can also help you with your water disposal system, and together with the other folks working through your soil conservation district, will help you plan to get the greatest possible amount of organic materials in your soil.

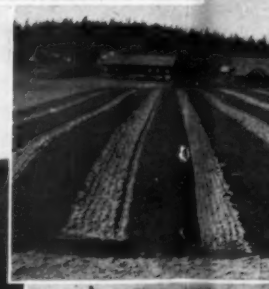
I have enjoyed being back here in New Hampshire with you again, and sincerely believe that as you continue to work together on your common problems, your progress during the years ahead will be greater even than the progress you have made, toward soil conservation during the last few years.

Soil Erosion in Scandina

SCANDINAVIA has nearly all types of topography, soils, erosion hazards, and degrees of erosion. There are soils subject to wind and water erosion, and there are winds and rainfalls intense enough to erode them.

At one place in Denmark the average annual precipitation varies from 20 to 30 inches, and during the years 1911–27 there were 7 storms with an intensity of over 2.8 inches per hour for a 5-minute period. Such storms, and others of lower intensity but generally longer duration, can be destructive.

(*Continued on page 262*)



1. Typical erosion in early 1947. Holmby, Sweden. (Photo by courtesy of Ph. Wolf.)

2. Washout of Harlösa Brook of the Kävlinge River system, Sweden, 1947. (Photo by courtesy of Ph. Wolf.)

3. Soil left after melting of snowdrift next to snow fence. It was probably loosened and carried by strong winds of February 27, 28, 1947. Stavieby, Sweden. (Photo by courtesy of Ph. Wolf.)

4. Farmland and forest near Månstadskulla, Västergötland, Sweden, 1947. The snow silhouettes the numerous stone walls. Fence rearrangement for conservation farming would be difficult in an area like this.

5. Fields in background show up-and-down plowing; Sweden, 1947.

6. New orchard planted in furrows running across the slope; south of Granna, Sweden, 1947.

7. A natural terrace of soil retained by a 4-foot wall; Röldal, Norway, 1947.

8. Two-foot step built by water-transported soil; Skåne, Sweden, 1947.

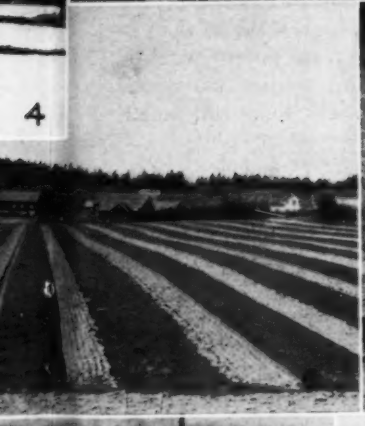
9. The wind's work, Ugerup, Sweden, 1941. (Photo by courtesy of G. Petersson.)

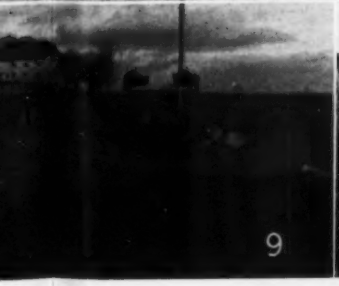
10. Discards from a sawmill protect tobacco; Nymö, Sweden, 1943. (Photo by courtesy of G. Petersson.)

11. Damage from the runoff of a storm in July 1937 in southern Sweden. About 6.3 inches of rain fell within a 3-hour period, according to Professor Mattson, of the Royal Agricultural College, who supplied this picture.

NOTE.—The author is studying on a fellowship in Sweden. He was for 2½ years with the Soil Conservation Service. Previous to that he was employed by the Forest Service, part of the time in Alaska. His headquarters are in Uppsala 7, Sweden.

dinavia .. by Vernon Hahn





Small erosion "fans" in a young orchard in Denmark, in the vicinity of Slagelse.

(*Continued from 260*)

In Sweden the average annual precipitation ranges from about 38 inches near the southwest coast to about 20 inches on the east coast. In July 1916 the Stockholm area experienced an intensity of 11.99 inches per hour for a 5-minute period or 6.54 inches per hour for a 10-minute period or 4.44 inches per hour for a 15-minute period. This was an exceptional cloudburst but an intensity of about 3.5 inches per hour for 10 minutes is not unusual. This last figure indicates what can be expected, as revealed by the records of 1909–18.

There is steep farmland in Scandinavia. In several places in Norway the hay is transported by cable and gravity from the mountainside direct to the hayloft further on down the slope. There are areas of long, gentle slopes subject to sheet erosion similar to that observed in the flat country of central Illinois. Most arable soils are derived from granites and gneisses and are either sedimentary or moranic in origin. The sandy areas have a variable complement of silt and clay and show a corresponding difference in texture. These areas are very susceptible to high-intensity rains, while the clay and silt loam soil areas are probably more susceptible to rainfalls of lower intensity but greater duration. To summarize, it can be stated that Scandinavia has the soil, topographic, and climatic factors conducive to excessive erosion under the existing practice of agriculture.

There are several symptoms of soil erosion, such as the naturally formed bench terraces. Sometimes 2 feet high in southern Sweden, they were built up gradually from soil caught by the grass in fence rows set perpendicular to the slope. Further observations reveal rather extensive sheet erosion but little drastic gullying. Sheet erosion may be compared with a slow, insidious disease: each storm carries away a little topsoil and each subsequent tillage tends to cover up the evidence. But cultivation or plowing cannot make new topsoil and will not make heavier subsoils easier to farm. Nor will it remove the stones which increase in number with each eroding season. In some regions, especially strengthened farm equipment must be used to farm the stony soils, made stonier every year through abnormal sheet erosion.

Some farm areas have open ditches running straight up and down hill, in the same direction crops are planted. These ditches probably started as dead furrows, and deepened and widened with every runoff. Little attempt is made to regulate surface runoff to the advantage of soil, crop roots and underground water supply. Fertilizers, organic matter, time and labor are wasted. The material carried by runoff water is either lost into the river system, or it settles out on bottom land which is fertile enough already.

Stavanger, Norway, had a heavy continuous rain on September 8, 1947, which cut miniature gullies in fields and gravel roads. Further inland from Stavanger there are steep slopes which have stone walls 3 to 4 feet high filled on the uphill side with soil washed from potato patches. These slopes are rocky and subject to serious erosion but there still remains some soil worth saving.

One farm north of Horsens, Denmark, appears to have a field-strip-crop system. The farmer works across the slope because he considers that to be the practical way, and he divides his lands into 8 fields for the rotation of turnips, barley, oats, and clovergrass. In spite of these simple conservation measures, erosion continues. Runoff waters from a thaw and storm of March 1947 cut a 2-foot gully through the center of the fields and the sound of the running water could be clearly heard in the farmhouse a long way off. The farm plowed in the gully but left it unprotected. It was suggested that he make a grass waterway and use narrower strips—but he regarded the soil losses as insignificant.

Improper land use is the main cause of excessive erosion. Improper land use may also be a serious factor in the reduction of crop yields and the lowering of the watertable in dry periods. One authority states that lack of water during the

summer limits plant growth in many parts of middle and southern Sweden, especially along the east coast. The summer of 1947 was dry and lake levels fell to a record low. Electricity and water had to be rationed in certain places. On one farm the watertable dropped so low that the cows had to be watered at a stagnant brook in the valley flat, a long way from the barn. The farm is located in a region partially forested and with such a high water-holding capacity that it was surprising to see the watertable drop so low. Maybe the drought revealed a weak point in the water relationships of that region, just as an unusually heavy cloudburst tests the effectiveness of soil and water conservation measures. A planned watershed-control system helps maintain a constant watertable. For example, in the upper Mississippi River area there is a small watershed with a year-round trout stream which once ran dry in the summer, before water and soil conservation measures were applied to the watershed.

On a farm in Denmark the potatoes were planted diagonally across the field, approximately on the contour. The farmer planted it so as to best utilize all rainfall. It was beneficial, but it could have been much better if the farmer had had access to the latest research and experiences in contouring, terracing, and cultivation techniques.

Active measures are being taken to combat wind erosion, and attention is also being given to other land-use problems. The Danish Heath Society is continuing its efforts to increase the number of windbreaks, to reclaim heath areas, and so on. Many sand dune areas have been stabilized. Some wet sand and peat areas are ditch-drained and then planted to selected strains of willow for the local basket industry. Certain heath areas are burned, plowed deep through podzol pan which is about 3 inches thick at 1-foot depth, and then planted to alternate rows of pine and spruce. The nurse crop of pine is cut after 16 to 20 years. Some blow-out areas and sand knobs have been planted to conifers.

Sweden is a country rich in forests and poor in agricultural area. And yet pine trees are planted on level land formerly farmed because the soils are too sandy and experience has shown that agricultural production on such soils is uneconomical. Many United States farmers on sandy soils ought to take a lesson here. It may be profitable for Sweden, also, to investigate wind erosion outside the sandy areas. A cutting wind storm of February 27–28, 1947 eroded and carried material from all types of soils and fields—even from land with some protection from surrounding woodlands.

Although wind erosion control is in progress in Scandinavia there is very little attempt being made to control water erosion. A survey of the Swedish literature brings to light a small booklet on soil erosion in southern Sweden by a man interested in improving small fish streams and a publication dealing with river sampling of a small river in central Sweden. River sampling does not measure field erosion. Furthermore, the publication states that there is some evidence that field ditches carry greater amounts of silt than the river. It also says: "This (the plot method of determining erosion) is in itself of very great interest." One weekly farm journal had a recent article on the U. S. Soil Conservation Service and its activities and stated that Sweden, luckily, had no corresponding problem!

It appears that the best way to appraise the problem would be to obtain reliable research data. The experimental plots necessary to determine the extent of soil losses can be constructed rather inexpensively and the practical value of the results

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might well repay the cost of the experiment. Of course, the results cannot be comparable to those available in the United States. They must be weighed according to the percentage of arable land, the population density, the size of farms, the climatic factors, etc. Another point worth looking into is that of the new methods of tillage which have proved to be very useful in controlling erosion.

Denmark, Sweden, and Norway take good care of their forests, improve their strains of cattle and crop plants, drain farmland and waterlogged forest land, and do a host of other things to improve yields and quality, with little regard to high initial cost. They know that these investments can be classified as permanent credits. Equally good or better investments are soil and water conservation practices. Since food is so vital to the world today, redoubled efforts should be made to increase its production. One of the best, and cheapest, ways would be to install the new, tested, and proved water and soil conservation practices.

REVIEWS

THE EARTH IS OURS. By Marion Pedersen Teal. 205 pages. Illustrated. Thomas Y. Crowell Co., New York City. 1948. Price $2.75.

This title is the sign of final ownership of a farm home and of the possession of the security such provides. The book is another one of the many giving testimony that finally we are coming to see the soil as our security and the need for the conservation of it. It is bringing the folks of the city to think about rural folks as an integral part of our national pattern in which no longer the rural standards can be much different from the urban.

This is the story of the first 6 years in ruraldom of the young couple of university graduates whose college education had converted them to metropolitan life only to have them backslide, after their first born, to the inherited farm in the Corn Belt. Each of 18 chapters moves along with this couple through the many events, some troubles, some trivialities, and some successes, that will be profitable reading to those equally as naive. Though not new, it will be amusing and entertaining to those grown up and always living on the farm. It will be especially good reading for any one transplanting himself to a farm without previous farm experience. To take over the management of a farm, to assume a $12,000 debt, to stock 230 acres by patronizing farm sales during wartime high prices, to convert a barren house into a home, to fit one's self into the community that was giving the book farmer only 3 years, and then to pay off the debt in 6 years, can be an interesting story to the reader, as told by the feminine partner of the couple for whom it was a real story.

Mrs. Teal portrayed the elements of the pioneer on the farm today and pictured the realities of rural life. Unanticipated as these were, they loomed large, in the problems and privileges connected with the snowstorms, the summer droughts, the drowning of the young chickens, the farrowing of the pigs, the handling of the hired man, getting acquainted with the neighbors, appreciating the historical elements in the locality, the social and business side of Saturday night in town, the Christmas Eve in the country school, and the interpretation of the community gossip in its proper human flavor—all of which are realities of the first magnitude on first acquaintance. The author makes them such for anyone not rural reared and experienced in farm lore.

The style is good, the descriptive terms are colorful and mechanics of thought delivery very smooth. The reader will move along rapidly to finish all too soon this distinctly human and entertaining portrayal of modern rural life.—WILLIAM A. ALBRECHT.

NORTHEAST

THAT'S A LOT OF EGGS!—Everett Rogove, Camburton Soil Conservation District, N. J., makes these comments:

"We have operated a poultry farm of 77 acres near Lakewood, N. J. for the past 10 years. We are breeders and hatchers, keeping 7,000 pullets and hens and raise about 5,000 pullets each year.

"On the hilly part of our farm we had bad sheet and gully erosion. Another problem was road water which was dumped on our fields. We were unable to grow grass on these fields, and we could not raise young stock on them. Due to the condition of our land, about 5 years ago we called on the Camburton Soil Conservation District supervisors to help. A farm planner of the Soil Conservation Service visited us and helped make a plan for our farm.

"We built 3 terraces with a total length of about 1,600 feet, and about 600 feet of outlet. We seeded 15 acres of range. The seed mixture consisted of Kentucky bluegrass, orchard grass, Ladino clover, and alfalfa. The present ranges consist predominantly of orchard grass and Ladino clover. These fields were limed and fertilized before seeding. By following the recommendations in the conservation plan, we have been able to grow much better pullets, and healthier ones, than before.

"Before we had established good ranges and were able to use these fields, we usually fed one-half to one-third mash to our pullets. We now feed about 90 percent grain and only about 10 percent of laying or conditioning pellets. The grass furnishes sufficient protein to let us follow these feeding practices. The good range has cut the cost of raising pullets. The cost of maintaining the range is only a fraction of what the additional feed would cost if we were unable to put our birds on these good ranges. I do not have exact figures, but I think the saving amounts to at least $1,000 a year.

"One thing unusual about the way we farm in this section is that we raise both corn and oats. The past few years we have raised about 14 acres of corn and an equal acreage of oats. We combine the oats and save the straw. This provides all the litter. We follow the build-up litter system. With this acreage of cultivated crops, we are able to haul all of the poultry manure to the crop fields. This eliminates the worry about disease being brought in from manure haulers.

"Our average egg production per bird is excellent. We won the Vineland Flock Mating contest for 1946–47, av-

eraging 232 eggs per bird. Last year we had the highest average of the 13 ROP breeders in New Jersey. The average production for all birds in the flock was 214. The average production per qualified bird was 243 eggs and we had the highest average of all entered birds which qualified, 62.4 percent.

"The practices called for in the conservation plan for our farm have helped us greatly in our poultry business."

PIGMENT PEPS UP.—"I have been in the poultry business for about 19 years," writes Hyman Kassenoff of the Camburton Soil Conservation District, N. J. "I usually keep around 3,500 White Leghorn layers, and have only 5 acres of land.

"My soil is very sandy. We could not keep any grass on the ranges which had been very badly washed.

"A little less than 4 years ago, I requested help from the Camburton Soil Conservation District. An SCS farm planner visited my farm and helped make a plan for the 3 acres used for range. The plan called for 700 feet of terraces to be emptied in a wooded area, which we built in 1945. These were seeded to a mixture of redtop, orchard grass, alsike, Ladino clover, and alfalfa. The field was limed and fertilized, and the grass mixture seeded with oats as a cover crop. This was done in the spring, whereas permanent seedings are usually done in the fall.

"This is the third season that this range has been used. We have raised about 2,000 pullets each year on the 3 acres of range. We have plenty of grass for our pullets and have stopped the washing of soil.

"We have been able to raise much healthier pullets on the grass, and we feel they are better to work with when they go into the laying houses. The pigment coloring in the legs of the birds has been much more pronounced. The cost of raising our pullets has been reduced. I think that the poultrymen in this section could benefit by having conservation plans made for their farms."

NOTE FOR ENGINEERS.—A simple slide rule that permits the design of terraces, diversions, and outlets for drainage areas up to 20 acres, without computations or reference to tables and charts, has greatly facilitated the planning of water disposal systems in the northeast.

The slide rule, developed by Gail W. Eley, SCS zone conservationist, Upper Darby, Pa., has been in successful operation for nearly 2 years. It is inadequate, of course, when more complex water disposal systems must be designed for watersheds larger than 20 acres.

To facilitate the production and use of the slide rule it was necessary to combine several of the controlling factors, which include size, shape, and slope of watershed, soil type, land use, and rainfall pattern. Because of the variation in rainfall it was decided to produce two rules—one for the northern part of the region and one for the southern States.

The cardboard rule is 3 inches wide and 6 inches long. Its two outside covers are taped together along the six-inch sides. and open at each end. The printed figures are on a separate piece of cardboard that slides up and down inside the taped covers.

At one end of the "front" side of the cover are windows for trapezoidal outlet design with openings for slope, depth in inches, bottom width in feet, and "Q" in cubic feet per second. At the other end on the same side are windows for diversion ditch design, with openings for grade, depth in feet, width in feet, and "Q" in cubic feet per second. Under each window is a sketch illustrating the type of design.

On the "back" side are windows for parabolic outlet design, with openings for slope, depth in inches, top width in feet, and "Q" in cubic feet per second. The type of design is also illustrated by sketch. The same side of the cover contains runoff curves, including the names of the States where the rule is to be used. Horizontally, the curves follow acres, from 0 to 20. Perpendicularly, the "Q" in C. F. S. is shown, from 0 to 50. There are two curves, one for pasture and woods and the other for cultivated land.

Here is how the rule is used: The expected "Q" or quantity of water to be handled by the structure is obtained from the runoff curves. That is done by selecting the size of the drainage area from the bottom line, following the line up to the correct curve, and then reading the "Q" on the left side of the chart. After the proper "Q" has been obtained the size of the diversion or outlet—trapezoidal or parabolic section—can be selected from the appropriate part of the rule. To do this, you first determine the grade on which the channel of the structure will be built. This is shown in the left-hand window. Then select the quantity of water to be handled from the right-hand window. The figure directly above this quantity will be the width of the structure, and the depth will be shown in the middle window.

—WALTER S. ATKINSON.

TENANT WON OVER.—"When my present tenant took over my farm (150 acres, 100 tillable) production records were practically nil," writes R. J. Guastavino, of the Kent (Md.) Soil Conservation District. "Cultivated land approximated 20 acres with practically no livestock being carried on the farm.

"With the adoption of a farm plan the poorer areas were set aside for hay and permanent pasture and poorly drained areas were made fit for cultivation by the installation of a drainage system.

"My tenant was very reluctant to adopt and follow the plan. However, as the program was established and results became visible his attitude changed.

"At the present time we have 80 acres in tillage with another 20 acres to be brought into production some time in the future. Our corn and wheat yield has doubled, our livestock earning capacity has increased due to our increased production of feed, hay, and pasture. A full utilization of the Government lime allowance has enabled us to establish legumes and grasses in areas formerly too sour for production.

"Through better land use we have followed a balanced rotation including tomatoes as a cash crop, distributed our work load, and reduced production costs, thus increasing the profit per acre."

SOUTHEAST

LAND USE EXPLAINED.—In assisting Hobert Sims, of the White County (Tenn.) Soil Conservation District, to develop a plan for his farm, the Soil Conservation Service technician referred to the soils map and commented that a certain field was not suited for alfalfa. Sims was surprised at this remark and asked why. The technician explained this was due to hardpan soil. Sims then related his experience in trying to grow alfalfa on this land, and said he thought it had failed because of the seed used. After that, he had full confidence in the technician and saw the value of his soils map.

T. B. Thornton

STREAMS HELD IN CHECK.—When the Augusta Chamber of Commerce was host at a Savannah River watershed flood control meeting this spring, T. B. Thornton of Hartwell, Ga., gave specific examples of the way soil and water conservation work is reducing flood damage.

Thornton is president of the Savannah River Soil Conservation Districts Association, as well as chairman of the supervisors of Broad River Soil Conservation District of Georgia.

"Broad River Soil Conservation District has been in operation 10 years," said Thornton at the meeting where details of the Department of Agriculture's survey of the Savannah watershed were explained by the Soil Conservation Service. "In this short period we have slowed down our surplus water so we have very little erosion.

"This has been brought about by contour planting, close-growing crops, and other practices. In this way we retard our surplus water so we do not have excessive erosion. Our streams do not overflow as they did many years ago.

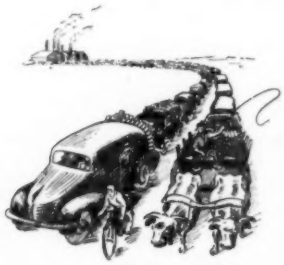
"It is common knowledge that our streams do not reach the high-water marks that they did before the coming of soil conservation.

"I was reared on a creek that overflowed so badly we had to abandon cultivation on much of our best land. The creek is still serving the same watershed but we seldom have freshets that destroy our lowlands. Much of this land is now in cultivation in crops or pasture.

"I call to mind a mark I made on a large tree many years ago, but have not seen this creek within 6 feet of this mark since we started soil conservation practices fitted to the land.

"The run off water in our streams does not carry so much silt as it did before we had soil conservation practices. Our lowlands are much more valuable than they were 10 years ago."

KNOW YOUR SOIL.—Some 90 soil types are found in Lord Fairfax (Va.) Soil Conservation District. They are derived from several rock formations in five areas roughly designated shale, limestone, sandstone, crystalline rock, and sandstone-and-shale. The district is featuring these areas in posters and other printed materials and urging "Apply today for a land capability map giving a complete inventory of the soils of your farm, and for assistance in the planning and application of soil and water conservation measures fitting the land and the farm economy. Use and conserve soil and rainfall. This will mean greener fields, clearer streams, and lasting security."



BY OXTEAM AND AMBULANCE.—F. C. Ewen, district conservationist at Morehead, Ky., was accorded a hearty greeting recently when he visited the Big Run Coal & Clay Co., Princeton, Ky. As an employee of the Soil Conservation Service, he was precisely the man the company had been waiting to see. Curiosity was at high pitch as a result of a white-hot demand for farm drainage tile. Six months earlier this company had manufactured a full million feet of such tile—and here it had only a skimpy 6,000 feet left! Every foot of the supply had been sold to cooperators of soil-conservation districts. Counties without districts showed little interest in the product. "What are these districts, anyway? And how do they operate?"

Ewen made this report: "Tile had been hauled away from the plant in carloads, by truck, by wagon, by oxen, by buggy, and by sacks. But the district cooperator who capped all modes of transportation was the one who brought a sick person to the Ashland Hospital and came back by the tile plant, covered the inside of his ambulance with corrugated paper, and hauled away 150 joints to finish up the tile system on his farm!"

NORTHERN GREAT PLAINS

WELCOME WATER.—"Spring run-off from the hills is my insurance against livestock feed shortages in winter," reports Joe Eggen, a cooperator with the Reserve Soil Conservation District in northeastern Montana.

Eggen's lay-out is along the broad Muddy Creek valley, said to be a preglacial channel of the Missouri, which is bordered by an expanse of rough upland that is largely range. Spring runoff from melting snow sends large amounts of water into the valley. Part of the Eggen farm is in the valley bottom, and part is upland range.

"We've got 65 acres under flood irrigation now, laid out by SCS technicians," Eggen said. "We have about 50 more acres to go. And believe me, it pays.

"For example, I had the first flood-irrigated field of wheat in 1946. It yielded 30 bushels per acre, compared with 15 to 20 bushels on dry land. Now that field produces just as well in alfalfa for hay. Last fall I had 14 big stacks of hay that came from that land.

"I was brought up on this farm, and during my life there has been hardly a year when there wasn't enough

water to give the bottomland a good soaking. The only 2 years that I can remember when there wasn't enough runff were 1934 and 1935. But even then, the stockwater dams filled, so there was enough water for livestock.

"And with that nearly a sure feed source, I can carry the number of livestock the range will support without being afraid of feed shortages."

SHELTERBELT BOOSTS YIELD.—A dryland field, protected by a shelterbelt, produced the highest yield, 106 bushels per acre, in the Stanton County, Nebr., corn-growing contest conducted by the Extension Service. The winner was Ernest Fuhrman of the Stanton Soil Conservation District.

The contest plot was 10 acres in a 90-acre field that is protected by trees. It was given no different treatment from the rest of the field. The whole field, however, has been contour farmed since 1942 with a rotation that included sweetclover, as part of the conservation plan the Soil Conservation Service technicians helped him develop.

Oats with sweetclover had been grown on the field in 1946, and last spring 10 tons of manure per acre were put on the land. A drouth in July and August lowered corn yields generally, but this field held up well.

"The shelterbelt made a lot of difference last year," Fuhrman said. "My best corn was near the trees. The farther you got out into the field from the shelterbelt, the less the yield."

"THE RAIN BELONGS TO ME."—Conservation farming has done much to solve his problem of too little water on most of his farm and too much on a small part of it, according to Joe S. Kampa, cooperating with the Day County Soil Conservation District, S. Dak. He began work on his conservation plan 2 years ago.

Now, he reports, he keeps much more rainfall where it falls on his 270 acres of sloping cropland by contour farming and terracing. And 21 acres, where water once accumulated in low places, has been drained. In both instances yields have been hiked as a result of conservation. Another important benefit lies in the control of erosion. Before conservation, his fields were washing badly and some gullies were too big to be crossed by farm machinery.

"I never did believe that an average of 20 inches of rainfall in one year was too much for a crop," Kampa said, "and I hated to drain any water off my land to some place where it couldn't be used.

"So, instead of draining water from these low places into a waterway and allowing it to run off the farm, we ran the water into a terrace and back around the hillside where it belonged, making sort of an irrigation system. That little stunt, along with the contouring, certainly helped yields on that land.

"Last spring during all those heavy rains there was just a little water that ran down the waterway and off my farm. The rest stayed on the hillsides where it belongs. The rain that falls on my farm belongs to me and, by golly, I'm going to try to keep it."

GRASS.—Grass pays farmers two ways, with income from the grass and with higher grain yields following grass, says Enoch Anderson, a cooperator with the North Burleigh Soil Conservation District in North Dakota.

"Net returns per acre from grass seed," Anderson explains, "are about the same as from other crops. But the grain crops following grass are up more than 10 percent, and the soil is in better condition to resist erosion."

Anderson's grass program is part of the farm conservation plan that Soil Conservation Service technicians have helped him apply. He began cooperating first with a CCC camp and then with the soil conservation district after it was organized in 1941.

"During the last 12 years," Anderson said, "I've seeded more than 400 of my 700 acres of cropland to tame grass as part of the crop rotation. Cropland is left in grass from 4 to 8 years, and each fall I seed an acreage equal to or a little more than what I broke out in the spring."

The tame grass also helps out in the pasture program. He uses the tame grasses in early spring and late fall, pasturing the native grasses in summer and early fall. This, he said, lengthens the grazing season 4 to 6 weeks, and in addition makes it possible for him to defer grazing the native grasses in spring.

ONCE WORTHLESS.—Harvesting a wheat yield of 25 bushels per acre from land that had been virtually abandoned in 1944 was the experience last year of John E. Olson, cooperating with the Atchison County Soil Conservation District in Kansas. Conservation farming had saved the land.

"The field was so badly gullied that it was almost impossible to farm it any more," Olson remarked. Soil Conservation Service technicians helped him work out a plan to conserve the whole farm. Terrace construction on the most severely eroded land was begun immediately.

Contour farming came next, and the field was seeded to small grain and red clover to start a grain-legume rotation. The increased production resulted.

WESTERN GULF

SMART SLOGAN.—*The Clay County Democrat*, published weekly at Rector, Ark., has begun printing a slogan reading "SAVE THE SOIL—IT WILL SAVE YOU" on its front page. The words appear immediately underneath the bold type that proclaims the paper's name. Editor H. C. Anderson says the local Clay County Soil Conservation District has "sold" him.

HOW TO AVOID IDLE LAND.—L. W. Rosenbaum, a cooperator with the Hansford County Wind Erosion District, near Spearman, Tex., uses crested wheatgrass and western wheatgrass along the edges of his fields on land not suited for cultivation. Crested wheatgrass proves the better of the two because it is the more palatable over the entire grazing season. Both grasses, however, are excellent for controlling erosion and making productive use of land that otherwise would be idle or subject to severe erosion, if cropped.

When the grazing season has ended, a grass seed crop may be harvested from these areas, a practice which also fits in well with the harvest of Rosenbaum's wheat.

These isolated areas are common in the Rolling Plains of Texas and Oklahoma and even on the High Plains, especially near the caprock, around lakes and in other localities of broken topography. Though usually small, such areas need not be wasted if treated and managed in a way to fit the rest of the conservation plan.

The kind of grass to seed on such areas depends upon the crops to be grown on the part of the field remaining in cultivation, and the use to be made of them. Other factors to consider are the climate and the soil, the equipment available for establishing grass, and the livestock that will use the grass.

If the field is planted to crops that will be grazed seasonally, the areas should be seeded to something that will afford grazing at the same time as the field crop. If the soil is shallow or stony, a grass that will do well on such soil should be planted. A specialized kind of grass should be avoided unless equipment for seeding and harvesting it is at hand. If the livestock are best suited to, and are in need of, winter grazing, cool season grasses are advisable.

In the Hansford County Wind Erosion District, cooperators are being assisted by Soil Conservation Service technicians in making practical use of field corners and edges by planting them to one of the winter-growing perennial grasses for grazing with the grain pastures. In this way they are not only protecting their land but keeping it in maximum production.—HERSHEL M. BELL.

KEEP THE LID ON.—"The land that is seeded to cover crops, such as vetch, oats, or winter peas, remains just as whole and fertile at the end of winter as it was in the fall," observes Fred McCollum, editor of the Forrest City (Ark.) Times Herald. McCollum is one of the most ardent and effective supporters of soil conservation in his State.

"Productivity per acre, rather than total acres in production, has long been recognized as a proper yardstick for all farm profit, and the man who plants winter cover crops, especially legumes, always shows up well in production per acre."

ARKANSAS TRAVELER PAYS OFF.—M. H. Bredehoeft, cooperator with the Arkansas-Verdigris Soil Conservation District, living on an upland farm one mile south of Broken Arrow, Okla., raised 83 bushels of Arkansas Traveler oats per acre last season, notwithstanding the fact that 40 percent of the oats were winter killed.

Bredehoeft started using lime with a legume in his crop rotation when he first developed a farm plan with the Soil Conservation Service, cooperating with the Broken Arrow CCC Camp, in 1936 and 1937.

He was one of the directors of the board of the Broken Arrow Soil Conservation Association, organized in 1936 to purchase rock phosphate in carload lots and some phosphate-spreading equipment. That early association introduced rock phosphate to Oklahoma for use in the soil-building program with legumes in the crop rotation. The organization discontinued operation in 1942 when the local Arkansas-Verdigris Soil Conservation District began full-scale operations.

The conservation practices recommended in Bredehoeft's conservation plan included the use of 2 tons of lime and 500 pounds of rock phosphate per acre, together with barnyard manure and a legume in rotation.

The legumes included cowpeas, mung beans and Korean lespedeza. These were seeded with small grain over a period of years.

After harvest in the summer of 1947 the farm showed a good growth of Korean lespedeza in the oat stubble along with quite a lot of Bermuda grass. This furnished summer and fall pasture for Bredehoeft's Hereford cattle. The Bermuda grass had no damaging effect on the yield of oats.

In August 1947 Bredehoeft harvested more than a ton of Korean lespedeza hay from the field where he raised the oats, and in October he prepared the land and seeded Traveler winter oats.

Summing up the 1947 yields, Bredehoeft got 83 bushels of oats per acre worth $1 per bushel and the lespedeza hay worth $18 per ton. That gave over $100 per acre gross income from this land and still doesn't account for the grazing which the field furnished.—J. A. Killough

M. H. Bredehoeft

SOUTHWEST

SCIENCE COMES TO THE RANGE.—Where dust storms once raged in the Grantsville-Tooele area in Utah, stock now grazes to provide living proof of the value of scientific range management.

Just a dozen years ago this was known as a dust area. It was not only useless for grazing or other purposes but also made living nearly unbearable in adjacent communities. The tract, able to support only 250 sheep, 4 months a year, stood as mute testimony to the evils of poor management. Today the same area supports 26 times that number of sheep. By the end of the year, horses, cattle and sheep will grow fat and bring smiles to the faces of owners.

This was all brought to pass after the Grantsville Soil Conservation District formed to combat the dust problem. The Soil Conservation Service provided technical assistance in grazing management, fencing and water development.

On-the-spot surveys by technicians determine available feed and when the area may be grazed. They also assist in estimating such supplementary measures as fences, water development and salting areas. Grasses for reseeding are selected for controlling wind and water erosion because of their large root systems, as well as

for their value and palatability for stock. Crested wheatgrass is primarily an early spring and fall grass, while fall wheatgrass promises to be a late spring and early summer feed.

Now the area is more than "holding its own." It also is useful as a means of building up other denuded ranges. While these are being revegetated, excess stock grazes in the former dust area. Thus, it plays a vital role in getting conservation established elsewhere.

Ray Hammond, Grantsville, secretary and treasurer of the district, was responsible for organization of the Grantsville district and has been a key man since its start. Other members of the board of supervisors managing the project are A. L. Hanks, Tooele, chairman; Hampton Worthington, Grantsville; Howard J. Clegg, Tooele, and Allen Warr, Erda.

ONE DAY *vs.* FIVE YEARS.—The most spectacular soil and water conservation demonstration in the history of the Southwest is scheduled to be held Labor Day, September 6, in the Canadian River Soil Conservation District, Quay County, N. Mex. It will involve the complete remaking of a 40-acre irrigated farm in a single day, says Morris Lewalling, secretary-treasurer of the district. The program calls for leveling, ditching, fertilizing, seeding, and the installation of irrigation structures.

The purpose of the demonstration, first of the kind in this part of the country, is to whet public interest in soil and water conservation. This work normally would require five years or more.

District supervisors have selected the farm of J. C. White, a 24-years-old veteran. White, who is married and has three children, started a dairy farm near Nara Visa soon after being discharged from the army. When his rented farmhouse burned, he was forced to sell his herd, and has used these funds to purchase the 40-acre irrigated farm. Most of the "remade" farm will be used as irrigated pasture for a new dairy herd.

Lewalling says that Labor Day has been selected so that business people can attend. This date comes before farmers get busy with the fall harvest, and it is a good time to plant pastures. Many persons from irrigated areas in New Mexico and Texas are expected to attend.

BRINGING IN THE WATER.—Seven years of effort by Phil Maestas, manager of the Santa Cruz Irrigation Co., finally developed plans for combining the main headings from the Santa Cruz River of the Mesilla, Ortegas, and Garcias ditches. This project is being pushed in cooperation with the Pojoaque Soil Conservation District, Santa Fe, N. Mex.

The three old ditches ran parallel for 1½ miles and served 195 farms including 1,400 acres of irrigated land. The work plan for the consolidation calls for a new heading, installation of sand-sluicing structures, and construction of a new 6,200 foot ditch. The productive farm of Frank Williams, a cooperator of the Pojoaque Soil Conservation District, has been cut by the three old ditches, but under the new plan only one ditch will be located on his land.

Excavations will be made without cost to landowners since the dirt from the new ditch will be sold for fills in Espanola and Riverside.

P. A. Campredon, Soil Conservation Service engineer, estimates that the improvement will reduce irrigation water losses by 25 percent, and that mantenance of the combined heading will be cut by half.

COTTON COSTS CUT.—Producing 1.5 bales of cotton on 2.5 acre-feet of water, bringing his average lint production up from 250 pounds per acre to 700 pounds within 3 years, and cutting $4 per acre off his chopping costs, is the record set by John Bowling, a supervisor of the Florence-Coolidge Soil Conservation District in Arizona.

Bowling first attained this yield in 1944 on 600 acres, some of which had previously been regarded as practically worthless. "The credit goes to deep plowing," he says, "and to the deep water penetration which results from deep tillage." After he gets the water down 5 or 6 feet, he doesn't need to irrigate again for about 120 days, except for light irrigation when the seed goes in.

Two things are going to be of prime importance to his farm in the years ahead, he believes: (1) soil and water conservation, and (2) more efficient, cheaper methods of production.

One important measure he uses to cut production costs is mechanical chopping. In 1944 he built a tool bar for working across the cotton rows. He mounts several 16-inch sweeps placed 25 inches apart at the bar. That leaves a 9-inch space between each sweep. Of course, it isn't selective about chopping, but it leaves 3 to 4 plants in each clump and cuts the cost of chopping from $4.50 to $5 an acre down to $1 to $1.50.

SIMULATED RAIN.—Irrigation by sprinkling, a method largely new in this area, has been started by Carl Judson on his farm 3 miles south of Wellington, Colo. Working with the Fort Collins Soil Conservation District, Judson has installed 1,600 feet of irrigation pipe for watering about 40 acres of irrigated pasture. The system is supplied from a well.

Judson's farm includes 220 acres, one-third of which he intends eventually to devote to grass. Part of the area will be used for growing seed of grasses adapted to special soil uses.

CANYON RESERVOIR.—A lifelong ambition of Henry Brown, one of the first cooperators of the Northeastern Soil Conservation District, Union County, N. Mex., is about to be realized through the use of district equipment and SCS techniques.

For more than 50 years Brown has had to depend upon flood flows to water the hay meadows on his ranch in the Long Canyon country. During dry years, when irrigation water was most needed, runoff was fast and flood flows subsided quickly, making proper irrigation impossible.

Brown has believed for years that if he could store a portion of the flood water to be used later, and if he could irrigate with a smaller head of water, that he could bring his hay meadows into highest production.

Finally, he worked out a cooperative agreement with the district under which a storage reservoir will be installed in a branch of the canyon. This will make possible one good irrigation of his hay meadows, in addition to the use of flood waters.

MAKING WATER BEHAVE.—The establishment of permanent soil and water conservation practices on 15 irrigation ditch systems, including 504 farms in the Pojoaque Soil Conservation District, in northern New Mexico, has been a recent outstanding accomplishment, according to W. A. Williams, Jr., chairman of the district board of supervisors.

Major improvements on the ditch systems along the Tesuque, Nambe, and Pojoaque creeks include the installation of two infiltration pipelines, one cement diversion dam, flumes along river banks and across arroyos, syphons underneath arroyos, straightening ditches and giving them a uniform width and slope, construction of brush jetties with diversion gates, drop turnouts and checks on the main ditches.

The total cost of this work was $12,000, which was paid by the various ditch systems, with the Soil Conservation Service furnishing technical assistance. Landowners along the ditches feel that these soil and water conservation improvements will repay the full cost of the projects within a few years through savings of water and maintenance costs alone.

SMOOTH FARMING.—Land leveling is the best investment that can be made on an irrigated farm, according to S. E. Sparks, chairman of the DeBaca County Soil Conservation District in New Mexico. Sparks bases his opinion on the fact that land which has been leveled on his farm now is producing almost double, water is being conserved, and time and labor in irrigating has been reduced greatly.

Sparks relates his experience in leveling 13 acres last year. "Before it was leveled one 7-acre field had to be watered by means of a ditch on three sides," he says. "This was very unsatisfactory because the water ran off the high spots and collected to a depth of 4 inches in a low area. This causes alfalfa on the high ground to dry out, while that in the low areas was flooded. Since this field was leveled properly, I can irrigate perfectly from one ditch, without borders, and my alfalfa production has been practically doubled.

"The other 6 acres had a high corner and several low spots where the alfalfa was continually being drowned out. Since that tract was leveled it irrigates fairly satisfactorily, but needs a little finishing to make it perfect."

Sparks recalls his experience with 3 acres in two fields that had to be irrigated from two ditches. "I worked with this problem for 2 years and didn't make enough to pay for my labor. I leveled the 3 acres about 3 years ago at a cost of $50 per acre. I put this field in alfalfa 2 years ago. Last year the 3 acres were grazed for a month in the spring. I cut the alfalfa only three times in the fall, but this paid me $125 per acre whereas, before leveling, I wasn't even paid for my labor.

"I now can irrigate all my land in half the time, with half the labor and probably not more than half the amount of water that was required before leveling." Sparks says.

OVERNIGHT PONDS.—Overnight storage ponds are fast becoming a "must" with farmers in the pump-well areas of the Iron County Soil Conservation District in southwestern Utah.

During irrigation periods most pumps operate constantly with the water going into ponds which average about 200 feet square and 5 to 6 feet deep.

Farmers who have such ponds usually stop irrigating around 9 o'clock at night and can resume around 6 o'clock in the morning with their pond full of water.

Chester Whitelaw, a GI farmer who follows this method, says he now can irrigate with larger heads, that the water covers his land more efficiently, and that he can see where the water is going. He also likes the idea of being able to get a good night's rest and not having to get up at all hours to attend to the flow of water.

Another district cooperator, Harvey Adams of Parowan, says: "My overnight storage reservoir has increased my crop yields by at least 25 percent. I never will attempt to farm without a storage pond."

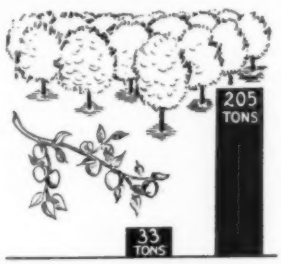
Another "must" with the farmers of this area is the practice of lining their ponds with bentonite because of the sandy nature of the soil. A. L. Graff, a district cooperator, reports that he never was assured of a pond full of water until he lined his reservoir. Now he has to keep watch on the water to prevent it from topping the banks.

RESULTS FROM LEVELING.—Value of land increased $50 per acre, crop yields increased 25 percent. Irrigation became possible in half the time and with half the water.

These results were accomplished by land-leveling on a 17-acre field on the Elwood Dalton farm in the Piute County Soil Conservation District in Utah.

Dalton did the job on his land with a tractor and home-made scraper. It cost him 10 cents a yard to move the dirt, or $17.50 per acre.

PACIFIC



HE LEARNED ABOUT HIS SOILS.—R. C. Goodman, owner of the Dry-Cot Ranch in the Douglas Soil Conservation District in north-central Washington, gathered only 33 tons of fruit per acre from his 34-acre orchard in 1943. It takes water to get good crop yields in the Wenatchee Valley.

The 33-ton output fell far short of the mark Goodman had set as the pay-off from his investment. He began severe pruning. He poured on fertilizer. Next harvest season his apricot crop shot up to 85 tons per acre.

Riding the crest of a bumper yield, Goodman started the 1945 crop year expecting another high yield. His hopes faded when the yield dropped to 60 tons per acre. Production skidded again the following season, with an output of 47 tons.

In an effort to store up moisture, Goodman plowed under his cover crop and began to practice clean cultivation. Soon "dusters" came and his unprotected soils began blowing away.

Stumped with the problem of serious soil loss, he told his troubles to the governing body of the Douglas Soil Conservation District, which asked the Soil Conservation Service to give technical help to the orchardist.

As the first step, Service technicians recommended that sprinkler-type irrigation be installed.

Goodman next dug a well on the flat below his farm, close to the Columbia River and installed a pumping system. Soon he had plenty of water. But there were still many things he didn't know about his soils and their capabilities.

"Service technicians made a soil survey of my place which showed the good and bad features of my soils," says Goodman. The soil samples were sent to the cooperative soils laboratory at Pullman to find out their water-holding capacities. They calculated the amount of irrigation water and how often it should be applied. They helped me plan a cover-crop program, a sort of vegetative blanket to cover my orchard and prevent erosion. The cover crop also put needed organic materials back in the soil. Fertilization helped speed growth of my cover crop."

Goodman has preserved the quality and flavor of dryland "cots" by irrigating only once on the deep soil and twice on the shallower soils in the spring before harvest. From the 35-ton mark of 1943, his apricot trees produced a 205-ton crop last season. His first cover crop effectively stopped erosion from "dusters."

Figuring expenses against last year's profits, Goodman estimates he paid half the cost of his sprinkler system from one crop of apricots. In fact, the system worked so well, that he plans to use the water to expand his orchard, putting back into production idle, nonproducing and dried-out portions of his lands.

THE URGE TO CONSERVE.—It's not enough to farm the conservation way. You have to *want* to do it, in the opinion of Paul C. McGrew, Washington State conservationist of the Soil Conservation Service.

McGrew recounts an incident which occurred on a farm tour of the Palouse (Wash.), grainland erosion area a year ago. The tour was timed to follow a period of heavy soil erosion damage.

Touring farmers noted there was no erosion on the Bill Redmond ranch, clearly indicating the gains from using soil-saving practices. During the discussion of the practices applied by Redmond to his sloping fields, a farmer inquired, "Bill, some of us put soil conservation work on our lands, too, but we haven't had the success you've had. What's the answer?"

Redmond, a man of few words, replied, "Well, first you have to *want* to do them."

Redmond came to the Palouse country more than half a century ago. He has never burned his grain stubble. He makes a practice of plowing so as to turn the furrow uphill. He doesn't cover stubble on steep slopes. He considers the stubble sticking out between the furrow slices an effective way of stopping soil losses.

He has not only taken good care of his lands, but has made money doing it. The records indicate that, Redmond's wheat yield was the highest in the community.

"BARGAIN RATE" DRAINAGE.—A community drainage project, completed last fall at a cost of $3,900, is expected to bring a $35,000 yearly gain in crops, pasture, and dairy products to 16 farmers in the Davis Lake settlement, near Morton, Wash.

For more than 20 years, the farm group has patched their raggedy-Ann, old-style drainage ditches to cope with heavy rainfalls and frequent overflows from Davis Lake in the heart of their rich, peat bottomland. After each highwater stage, the farmers' mopping-up operations offered only a piecemeal answer to the problem. Each year three-fourths of the 670 acres of water-logged, tussock-covered farmland was left untillable and unproductive.

With dairying and farming limited to the upland portions of their saucer-shaped acreage, the farmers' outlook for the 1948 cropping season appeared darker than usual. At that time Davis Lake spilled out over some 480 acres.

Through the Lewis County Soil Conservation District, the Davis Lake drainage district obtained the help of farm drainage specialists of the Soil Conservation Service at Chehalis. These technicians surveyed the bogged-down acreage with drainage-district members.

They pointed out the "bottle-necks" in the drainage system and the structural changes required to put the ditches and main channel in working order. Most of the ditches were clogged with silt and debris. Surveys showed the watertable had risen an average of 1 inch per year, or approximately 2 feet up to 1945.

Davis Lake farmers completed the recommended changes in the drainage system last summer. Improvements included lowering the water level, widening, deepening and straightening of the main outlet channel.

Almost as soon as the main channel was completed, landowners in the community began cleaning out the network of farm drains. These ditches, crisscrossing the 16 adjoining farms, carry surface water to the drainage channel.

Tillage operations can now begin earlier each spring. All 670 acres of the once-spongy land will be back in production. The dry land will be used for specialty truck crops and seed-selected pasture grasses and legumes.

An example of the gains anticipated by individual farmers is dairyman Mike Sturza's prediction that use of his entire 32 acres will enable him to increase the carrying capacity of his dairy herd from 14 to 20 cows. Most farmers in the area were expected to double their hay output now that their lands can be worked.

In "dollars and cents," Sturza estimates that the drainage improvement program will mean about a $35,000 gain, across-the-board, for the Davis Lake farm group. Landowners will prosper in proportion to the amount of land drained and the type of crops grown.

As a community enterprise, the farmers received bargain rates on engineering and technical phases.

"The drainage job would have cost us $16,000, or more, instead of $3,900 if we tried to do the work without the trained help of Service drainage experts," Sturza says

Today, farmers in several neighboring communities in the Morton region are eyeing the Davis Lake Drainage work. Some are already planning similar group drainage programs as prerequisite to full-scale use of their lands.

REPORT FROM SEVEN DISTRICTS.—Farming throughout the Yakima Valley in central Washington has had a "rags to riches" growth. Since '72, when the first irrigation channel was dug, linking the Yakima River with the town of Yakima, farming has mushroomed. Bringing water to the farmers' moisture-thirsty croplands was the primary purpose of soil- and water-saving on farms from Ellensburg to Kennewick.

Seven soil conservation districts are now operating in Yakima and Benton Counties. They have set their goal at putting conservation work on more than 1,750,000 acres of farm and range land. The districts include Wenas, Hi Land, Ahtanum, Roza, East Benton, West Benton and Lower Yakima Valley.

Some of the practices being applied include crop rotations, fertilizing, permanent cover crops on orchard lands, improved pasture seedings, efficient management of pastures, drainage, land leveling, control of noxious weeds, and improvement of "low yield" irrigation systems.

Gains from the "farmer action" programs are many. Here are a few examples:

In the Wenas SCD, in 1946, Soil Conservation Service engineers and technicians assisted farmer-members in designing sprinkler irrigation systems for 44 farms, averaging from 4 to 160 acres per system. Around 96,400 linear feet of pipe line were used in installation. The work benefited 1,179 acres.

District cooperators of the Roza district leveled 1,135 acres as the first step to improving irrigation systems. Some 970 acres of approved rotations were established and 875 acres of cover crops seeded for green manure.

Ahtanum district farmers laid a total of 18,000 linear feet of new and rehabilitated drains which directly benefited 532 acres.

Supervisors of both the East Benton and Ahtanum districts have purchased portable, 100-gallon, weed spray rigs for rental to cooperators. East Benton district also owns a 10-foot combination grain and fertilizer drill.

The Wenas governing body reports the district is maintaining 100 miles of fire trails over 78,000 acres of range land, as part of their district fire control program.

Hi Land district supervisors obtained advance rentals totalling nearly $6,000 from orchardist-members to buy a brush-shredder. Rentals from several cooperators range from $50 to $100.

RESEARCH POINTERS

Prepared by J. H. Stallings

DESIGNING FARM PONDS.—The secret of successful farm pond designing is to provide for adequate water to fill the pond and guard against excessive silting, according to L. L. Harold, SCS research, Coshocton, Ohio. To provide for adequate water supply, allow sufficient drainage area to furnish ample quantities of runoff water in the pond during critical drought periods. Excessive silting can be avoided by keeping the drainage area down to the absolute requirements of the storage capacity of the pond and by keeping at least 50 percent of the drainage area in permanent vegetal cover, such as grass or woods.

TIME AND FUEL REQUIREMENTS.—Farming on the contour requires less time and fuel than farming up and down hill, states E. L. Barger, SCS research, Manhattan, Kans. Where up-and-down-hill travel was in one gear lower than down and contour travel, there was a time saving of 20.4 percent ahd a fuel saving of 11.7 percent in favor of the contour farming. Where the up-and-down and contour travel was in the same gear, there was a time saving of 1.8 percent and a fuel saving of 6.4 percent in favor of the contour farming.

FARM PONDS AND FISH DEVELOPMENT.—Failure in fish development in farm ponds in the Midwest is due primarily to improper adjustment of the size of the farm pond to the adjacent watershed, excessive weed growth, and lack of care in stocking, is the belief of W. L. Anderson, SCS, Milwaukee, Wis. Proper adjustment of the size of the pond to that of the watershed supplying water for it is essential for most efficient water supply. Controlling weeds in the pond and proper stocking with fish are other essential requirements for successful pond management.

MORE DIGESTIBLE NUTRIENTS.—Conservation farming increased crop yields from 9 to 21 percent, according to E. L. Sauer, SCS research, Urbana, Ill. Both higher yields and larger acreages of better pastures caused the high conservation farms to produce more total digestible nutrients. This resulted in higher livestock production on the farms with well developed conservation programs. Farms with no such programs, or poorly developed ones, were compared with similar farms with well developed conservation programs in six major agricultural areas in the State.

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DETROIT

Magazine Is "Type of Help We Need"

Fifteen farmers in Lincoln County received 1-year subscriptions to Soil Conservation in May, as gifts from the First National Bank of Lincolnton, N. C.

These men were beginning the application of a complete farm soil and water conservation program in cooperation with the Lower Catawba Soil Conservation District.

Since that time, the First National Bank of Lincolnton has sent a year's subscription to the Soil Conservation Service's official publication to each other Lincoln County farmer who has made a conservation plan with the district's help.

G. Harold Myrick, executive vice president of the bank, is writing each new district cooperator a letter of congratulation for "starting a program which will make your farm a better place to live and will strengthen your community, your State, and the Nation."

"The First National Bank of Lincolnton also wants to assist you in getting all the planned conservation measures on your farm," Myrick continued in his letters to the first group of 15 farmers receiving the magazine. "We are arranging for a 1-year subscription of Soil Conservation Magazine to be sent to you with the compliments of our bank. We believe that this magazine, the official publication of the Soil Conservation Service which helped you make your conservation plan, will give you much valuable information and will encourage you in your new undertaking."

The plan was worked out by Myrick and District Supervisor Dave Killian.

"The First National Bank recognizes a complete soil and water conservation program as good business for us and for everyone else," Myrick said.

"We supervisors of the district greatly appreciate this assistance from the First National Bank of Lincolnton," said Killian. "It is exactly the type of help we need to get more soil conservation on the land faster. More and more our business and professional people are recognizing how great an interest they have in our land."

First farmers to receive gift subscriptions to Soil Conservation were G. P. Jenks, P. P. Richard, Dr. C. B. Yount, S. W. Wade, William E. Boyles, D. C. Killian, J. P. Huss, R. B. Gilbert, T. B. Parker, Calvin Mosteller, Hall Avery, Orville K. Hager, Ralph Foster, B. F. Baxter, and P. T. Nixon.

Each of these men had prepared a complete conservation plan with help from Stanley Pollock, Soil Conservation Service technician assigned to the Lower Catawba District in Lincoln County.

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SOIL CONSERVATION SERVICE

SOIL CONSERVATION—INDEX TO VOLUME XIII

AUGUST 1947 TO JULY 1948

Page

Airplane tour of soil conservation district---- 165–167
ALBRECHT, WILLIAM A., reviews of books—
The Earth Is Ous---- 264
Tomorrow's Food---- 22–23
ANDERSON, NORRIS J.: Some Economic Aspects of Soil Conservation---- 214–216
Annual Conference on Conservation, Nutrition, and Health---- 66–68
Apple growing, soil requirements---- 255–256, 259
ARTHUR, I. W.: Save Soil on Rented Farms---- 85–87
Association of Soil Conservation Districts, certificates of membership---- 222
ATKINSON, WALTER S., slide rule production and use---- 265

Bahia grasses, tests on land utilization projects---- 159–161, 168
BAILEY, RICHMOND Y.—
Grasses and Legumes Tested on Land Utilization Projects. With L. B. Scott and L. J. Leffelman---- 158–161, 168
honor award---- 164
Leadership Is Where You Find It---- 58–61
Baltimore & Ohio Railroad, award---- 202–203
Banker—
appraisal of our duty to soil. Wallace D. Malone---- 135–137
look at land. Charles T. O'Neill---- 217–219
BARNARD, JOHN W.: District Profile: Guy A. Leader, Poultryman---- 230–231
Beans, production on contour---- 246
Beavers, introduction for gully work---- [2], 6
BELL, HERSHEL M.: Wheatgrass for erosion control---- 267–268
BENNETT, HUGH H.—
article, reprint from *Soil Science*---- 57
commendations---- 134
Death of E. C. McArthur---- 76
honor awards---- 46, 93–95, 164
Looking Backward—and Forward—on the Conservation Front---- 237–239
BENNETT, JACKSON: Loblollies and the Land. With Peter W. Fletcher---- 114–115
BENNITT, RUDOLF, review of The Land and Wildlife---- 47

Page

BERTRAMSON, B. R.: Top Choice of Indiana Students---- 217
"Big Muddy," behavior. George B. German---- 229, 244–245
BLACK, CLAWSON, SAYRE, and WILCOX: Farm Management. Review by A. M. Hedge---- 68–69
Blotter for Pelican State. H. B. Martin---- 212–214
Blue lupine seed, harvesting. Hermann Postlethwaite---- 200–201
Blue Ridge Soil Conservation District, report---- 10
BODDY, HERBERT R. N.—
A Plan on Every Farm---- 3–6
Drainage Keeps Willow Grove "High and Dry"---- 162–163
Frontier Ranching Where the Skagit Flows---- 227–229
There's Cash in Those Woods---- 251–252
BRANNAN, RALPH D.: Father-Son Team Remakes Farm---- 118–120
Breaking new ground. Gifford Pinchot. Reviewed by John Keller---- 190
BRINK, WELLINGTON—
Crow Tribe Extends Heap Big Welcome to Chief Long John Jasper Whitebird---- 93–94
Soil Sleeps Under Fodder Blanket---- 149–151
Water Put to Work---- 123–129
Brome grass, use in waterways---- 186–189
BROWN, GROVER F.: Live Soils Are Rich in Humus---- 255–256, 259
BRUCE, O. C.: Guides Speed Conservation in Northeast---- 137–139
BUCK, C. WALLACE: Crop Residues Serve Two Farmers Well---- 177–178
BURTON, GLENDON P.: Six or Eight Heads Better Than One---- 78–80

Cash in woods. Herbert Boddy---- 251–252
Cattle—
ranch---- 246–247
ranching with aerial map---- 211–212
Chambers of Commerce, subscriptions to Soil Conservation Magazine---- 57
Chehalis River bank, protection---- 257–259
Chicken—
farm, improvement---- 264–265
farming on contour---- [210], 220

Page

Children, instruction 171–173, 180, 235–236, 239–240, 245, 248
Chino Valley Irrigation District, dam 140–141, 144
Church—
  aid to soil conservation 41, 174–176, 180, 190
  sowers, and soil. Ray F. Magnuson 174–176, 180, 190
"City farmers," excitement over maps. Howard C. Johnson 195–197
Classroom conservation. Adrian C. Fox 235–236, 239–240
CLEATON, JOHN A.: Save the Soil and Save All 83–84
Clover-corn production 222
Colleges offering major in soil conservation 148
Compensation for unexhausted improvements 102–103
Conference at Ohio University, June 28–29, 1947 66–68
Conservation—
  aid from—
    bankers 217–219
    chambers of commerce 57
    church 41, 174–176, 180, 190
    Wallace Malone. Leroy Horn 48
  by tile drainage 108–109
  district law of New Mexico 6
  front, backward and forward looks. Hugh Bennett 237–239
  in classroom. Adrian C. Fox 235–236, 239–240
  in Northeast sped by guides. O. C. Bruce 137–139
  in Scandinavia 260–264
  instruction for children 171–173, 180, 245, 248
  planning and treatment 38–39
  publicizing ..... 10, 41, 47, 80, [146], [170], 196, 208, 221, 267, 272
  See also Soil conservation.
Contests—
  field trips by school children 30–31
  National Amateur Field Quail Championship 6
  soil conservation essay, South Carolina 20
Contouring—
  beans 246
  combination with stubble mulch 177–178
  corn 69, 152–153
  in North Carolina 216
  potatoes 247
  saving in time 272
  steep slopes, results 120
Cooperation—
  association in Utah 221
  building diversion dam 140–141, 144
  drainage in Louisiana 212–213
  drainage in New York 248
  flood control 105, 107
  organizations 39–40
  owner and tenant 85–86, 101–102
  preparation of technical guides 137–139
  remaking two farms 132–134
Coosa waters, calming. John McKinney 104–107
Corn Belt nurseries, planning 14–16

Page

CORDELL, E. S.—
  His Fences Cost More Than the Farm 157–158
  Little River's No. 1 Hired Hand 55–57
Corn—
  contouring 69, 152–153
  growing on experimental watersheds 152
  growing scientifically. A. E. McClymonds 152–153
  picker, advantages 149–151
  shift from cotton 191
Cotton—
  farming—
    shift to corn 191
    shift to dairying 51–54
    shift to rotation 80
  production, deep tillage 269
  yield, effect of conservation 21
Cover crops, winter, value 268
Cowlitz Soil Conservation District, drainage 162–163
Crayfish—
  control. Verne E. Davison 27–29
  damage 27
Crop—
  residues, service to two farmers. C. Wallace Buck 177–178
  yields, improvement 272
Cropping practices, Yakima Valley 271
CROW, JOE MEDICINE, remarks 94–95
Crow tribe—
  member, remarks 94–95
  welcome to Chief Whitebird. Wellington Brink 93–94
Cypress Woods Farms, land use planning 11, 16

DDT, use in control of crayfish 28–29
Dairy production in South Tillamook District 96
Dairying aids 191
DALE, TOM, review of Heaven's Tableland 206
DAVIES, ROSS D.: Fire Fighting Saves the Range 198–199, 204
DAVISON, VERNE E.: What To Do About Crayfish 27–29
Decade of Progress. R. W. Rogers and H. C. Fletcher 35–41
Denmark, soil erosion 260–264
DIENER, H. C.: Specialized Education for Soil Conservation 147–148
Mrs. DOHERTY, rancher with a map 211–212
Drainage—
  at Willow Grove. Herbert Roddy 162–163
  community project 271
  for waterlogging 142–144
  in Louisiana 212–214
  in Maryland 247
  in South Carolina 123–127
  in Washington 220
  tile 108–109, 204, 266
DUNDAS, JACK P.: Trempealeau Schools Look at the Land 30–31
Durham, Bill, honor award 220
Dust Bowl farms, reclamation 268–269

Page

Earth ours. Marion Pedersen Teal. Review by W. A. Albrecht ---- 264
Economic aspects of soil conservation. Norris J. Anderson ---- 214–216
Education—
children ---- 171–173, 180, 235–236, 239–240, 245, 248
outdoor laboratory ---- [250]
specialized, for soil conservation. H. C. Diener ---- 147–148
Ellerbe, C. M.: Milbank Rescues Drowning Acres ---- 11, 16–17
Engineering, slide rule. Walter S. Atkinson ---- 265
Erosion—
control—
cooperative project ---- 132–134
in Kansas ---- 267
in Maryland ---- 222
in Nebraska ---- 87
occurrence and prevention in U. S. S. R. ---- 18–19
prevention by crop residues ---- 177–178
prevention by grassed waterways ---- 184–189
soil, in Scandinavia. Vernon Hahn ---- 260–264
Exploring the World About Us, motion picture ---- 246

Faith and hard work building terraces. Dale Jaedicke ---- 91–92
Farm—
cost less than fences. E. S. Cordell ---- 157–158
improvements by tenant ---- 102–103, 107
management. Black, Clawson, Sayre, and Wilcox. Review by A. M. Hedge ---- 68–69
management and soil conservation. A. M. Hedge ---- [24]
planning, results in increased production. O. J. McDougal ---- 116–118
plans, basis for gains, letters ---- 70–72
rebuilding in one day ---- 132–134, 246, 269
run-down—
profits in North Carolina ---- 69
remaking—
Arkansas ---- 87
Colorado ---- 71, 110–111, 113, 192
Georgia ---- 95, 118–120
Maryland ---- 222, 265
Mississippi ---- 51–54
Nebraska ---- 70
North Carolina ---- 191, 224
Ohio ---- [74], 80
Oklahoma ---- 75–77, 112–113, 157–158
Tennessee ---- 58–61
Washington ---- 220, 221
tackling. Otho J. Gipe ---- 64–65, 69
Farmers' Day, Kiwanis Club ---- 246
Farming, shift from cotton—
to dairying ---- 51–54
to pine ---- 115
to rotation ---- 80
Farms, rented, soil salvage. I. W. Arthur ---- 85–87
Father-Son team remakes farm. Ralph D. Branan ---- 118–120

Page

Feed, prime, at low cost. Winnett J. Fite ---- 232–234, 240
Fertilizers for grassed waterways ---- 188
Fire fighting on range. Ross D. Davies ---- 198–199, 204
Fite, Winnett J.: Prime Feed at Low Cost 232–234, 240
Fletcher, H. C.: Decade of Progress. With R. W. Rogers ---- 35–41
Fletcher, Peter W.: Loblollies and the Land. With Jackson Bennett ---- 114–115
Flood control—
Coosa River ---- 105, 107
Georgia ---- 266
Flying Farmers wing across district. Washington R. O'Brien ---- 7–10
Fodder—
blanket, soil under. Wellington Brink ---- 149–151
mulch, production ---- 149–151
Fonda, Morris E.: They Talked of Living Soil ---- 66–68
Food supply, world, production ---- 215
Four years' transformation. O. L. Putman ---- 112–113
Fox, Adrian C.: Conservation in the Classroom ---- 235–236, 239–240
"Freckled nose," education for growing up. Paul T. Gilbert ---- 171–173, 180
Friends of the Land, conference at Athens ---- 66–68
Frontier ranching by the Skagit. Herb Boddy ---- 227–229
Fruit production, soil requirements ---- 255–256, 259
Fuller, Guy C.: Owners Seek Light on Land ---- 179–180
Funds, public, stewardship ---- 40
Future, hope for. Walter C. Lowdermilk ---- 42–45

Garden, irrigation ---- 167–168
German, George B.: Make "Big Muddy" Behave ---- 229, 244–245
Gilbert, Paul T.: When Our "Freckled Nose" Grows Up ---- 171–173, 180
Gipe, Otho J.: He Tackled a Run-Down Farm ---- 64–65, 69
Graham, Edward H.: The Land and Wildlife. Review by Rudolf Bennitt ---- 47
Granite Creek diversion dam, building. Charles F. Rork ---- 140–141, 144
Grass—
in Kansas ---- 167
new, in northern Great Plains. A. D. Stoesz and Hugh K. Richwine ---- 241–243
program, benefits ---- 267
Grassed waterways in Kansas and Nebraska. Ira K. Landon ---- 184–189
Grasses—
sought in Arizona ---- [194], 205
tests on land utilization projects. R. Y. Bailey, L. B. Scott, and L. J. Leffelman ---- 158–161, 168
Grazing tests on land utilization projects ---- 160, 161, 168
Great Plains, northern, new grasses for. A. D. Stoesz and Hugh K. Richwine ---- 241–243
Green manure, value of vetch ---- 155–156

Page

Green Mountain District, new lands opened. A. E. McClymonds ... 32–34, 46
Group—
conservation jobs ... 39
planning in West Virginia ... 78
Guides—
speed conservation in Northeast. O. C. Bruce ... 137–139
technical, preparation and use ... 138–139
Gullies—
eradication ... 222
filling and planting ... 59–60
grassing ... 184–189

Hafenrichter, Atlee L., honor award ... 164
HAHN, VERNON: Soil Erosion in Scandinavia ... 260–264
HARTMAN, S. C.: They Looked at the Land From a Plane. With E. V. Jotter ... 165–167
Hay yield up 300 percent. Clarence S. Jones ... 110–111, 113
Heaven's tableland. Vance Johnson. Review by Tom Dale ... 206
HEDGE, A. M.: Soil Conservation and Farm Management ... [24]
Highway 64, Iowa, conservation planning ... [26]
Honor awards—
ceremony on Monument grounds ... 164–165
in Baltimore & Ohio contest ... 202–204
to H. H. Bennett ... 46, 93–95, 164, 237–239
to Bill Durham ... 220
to Harry T. Kelsh ... 208
to Little River board of supervisors ... 55
to William Redman ... 202–204
Hope for future. Walter C. Lowdermilk ... 42–45
HORN, LEROY: Aid of Wallace Malone ... 48
HUMPHREY, WALTER: Spread of soil conservation information ... 57
Humus of live soils. Grover F. Brown ... 255–256, 259

India, visitors from ... 231
Insurance for farmers ... 41
Inter-American Conference on Conservation of Renewable Natural Resources ... 254
Intermediate wheatgrass for northern Great Plains ... 241–243
Irrigation—
benefits in New Mexico ... 231
ditches, consolidation ... 269
diversion dam ... 140–141, 144
for dairying ... 207
for profit. Frank Kimball ... 88–91
from well ... 168, 269
garden ... 167–168
hay meadows ... 269
in Nebraska ... 150
leveling for ... 148, [170], 207, 270
orchard ... 150
pastures in Colorado ... 246
problems ... 148
protection from "dusters" ... 270

Page

Irrigation—Continued
reservoir ... 246
seven districts, Yakima Valley ... 271
single-day demonstration ... 269
systems, improvements ... 269
water from melting snow ... 266–267

Jackrabbits, spread of juniper ... 205
JACKSON, HOWARD C.: "City Farmers" Get Excited Over Maps ... 195–197
JAEDICKE, DALE: Faith—and Hard Work—Built These Terraces ... 91–92
Jesuit fathers, stewards of soil. Guy R. Jones ... 62–63, 69
Johnson, Arthur J., honor award ... 164–165
JOHNSON, VANCE: Heaven's Tableland. Review by Tom Dale ... 206
JONES, CLARENCE S.: Hay Yield Up 300 Percent ... 110–111, 113
JONES, GUY R.: Jesuit Fathers Are Skilled Stewards of the Soil ... 62–63, 69
JOTTER, E. V.: They Looked at the Land From a Plane. With S. C. Hartman ... 165–167
Juniper, spread, causes ... 205

Kansas, grassed waterways. Ira K. Landon ... 184–189
KEESEE, M. J.: Mississippi Rolls Out a Green Carpet ... 51–54
KELLER, JOHN, review of Breaking New Ground ... 190
Kelsh, Harry T., honor award ... 208
KILLOUGH, J. A.—
Growing Arkansas Traveler Oats ... 268
20 Acres ... 75–77
KIMBALL, FRANK: Irrigating for Profit ... 88–91
Kirk, Alexander, Ambassador, appreciation of conservation services ... 48
KRIMGOLD, D. B., abstract of Protecting Soils in the U. S. S. R. ... 17–19
Kudzu, use in reclaiming land ... 59–60, 65, 84

Laboratory, outdoor ... [250]
Land—
and wildlife. Edward H. Graham. Review by Rudolf Bennitt ... 47
capability classes, utilization ... 117–118
capability table ... 139
classification, application to pine growing ... 115
drained, cultivation ... 127
flood-ruined, restoration ... 253–254
leveling in—
Arizona ... 207
Colorado ... 207
Nebraska ... 148
New Mexico ... [170]
Utah ... 207, 270
looking at from plane. E. V. Jotter and S. C. Hartman ... 165–167
once-flooded, bumper crop yield. Marion H. Weaver ... 253–254
stewardship for future ... 42–45
tenure for soil conservation. E. C. Weitzell and M. M. Tharp ... 99–103, 107

Page

Land—Continued
use—
capability map ... 52, 255
exploitative ... 99–101
on run-down farm, Mississippi ... 51–54, 96
on run-down farm, South Carolina ... 11, 16
on run-down farm, Tennessee ... 58–61
on run-down farm, Texas ... 64–65, 69
profits in Indiana ... 71
shift from cotton ... 51–54, 80, 96
utilization—
in Maryland ... 246
projects, grasses and legumes tested. R. Y. Bailey, J. B. Scott, and L. J. Leffelman ... 158–161, 168
Land-use capability table, use ... 139
LANDON, IRA K.: Grassed Waterways in Kansas and Nebraska ... 184–189
Lands, new, opened in Green Mountain District. A. E. McClymonds ... 32–34, 46
Law, district, of New Mexico ... 6
Leader, Guy A., poultryman. John W. Barnard ... 230–231
Leadership where found. R. Y. Bailey ... 58–61
Lease—
flexible farm ... 101–102
provisions for conservation ... 103, 107
rider, use ... 85, 86, 103
Leavitt, Kent, top man. Robert B. Thornton ... 130–131
LEFFELMAN, L. J.: Grasses and Legumes Tested on Land Utilization Projects. With R. Y. Bailey and L. B. Scott ... 158–161, 168
Legumes, tests on land utilization projects. R. Y. Bailey, L. B. Scott, and L. J. Leffelman ... 158–161, 168
Leopold, Aldo, tribute ... 254
Lespedeza, bicolor, quail food ... 6
Letters—
district quarterly ... 248
from farmers ... 70–72
Leveling. *See* Land leveling.
Little River Soil Conservation District, honor award ... 55
Little River's No. 1 hired hand. E. S. Cordell ... 55–57
Loblollies and Land. Jackson Bennett and Peter W. Fletcher ... 114–115
Logging, profits ... 251–252
Louisiana Dept. of Public Works, work ... 212–214
LOWDERMILK, WALTER C: A Hope for the Future ... 42–45
Lupine, blue, seed, harvesting. Hermann Postlethwaite ... 200–201
Lutherans, advocates of conservation ... 41

MAGNUSON, RAY F.: Soil, Sowers, and the Church ... 174–176, 180, 190
MALONE, WALLACE D.—
A Banker Appraises Our Duty to Soil ... 135–137
conversion to soil conservation ... 136
Manager of Little River Soil Conservation Dist., work ... 55–57

Page

Map—
aerial, use by woman rancher ... 211–212
land-use capability ... 52, 255
making, aerial, honor award ... 208
soil, advantage ... 255
MARTIN, H. B.: A Blotter for the Pelican State ... 212–214
McArthur, E. C., death. H. H. Bennett ... 77
McCLYMONDS, A. E.—
New Lands Opened in Green Mountain District ... 32–34, 46
Science Tells Us How to Grow Corn ... 152–153
McDOUGAL, O. J.: Increased Production from Farm Planning ... 116–118
McKINNEY, JOHN—
Calming the Waters of the Coosa ... 104–107
District Profile: A. Threlkeld ... 20–21
Meetings of owners for study of conservation ... 179–180
Melons, growing with rye ... 220
Michigan Flying Farmers, tour ... 7–10
Milbank, rescuer of drowning acres. C. M. Ellerbe ... 11, 16–17
Mississippi, green carpet. M. J. Keesee ... 51–54
Missouri River, behavior ... 220, 244–245
Motion picture—
Exploring the World About Us ... 246
Raindrops and Soil Erosion, revision ... 96
Mount Arbor Nurseries, planning ... 14–15
Mulch—
fodder, production ... 149–150
stubble, prevention of erosion ... 177–178

Nebraska, grassed waterways. Ira K. Landon ... 184–189
Negro—
farming, improvements ... 224
success, Oklahoma ... 75–77
success, Texas ... 64–65, 69
New lands opened in Green Mountain District. A. E. McClymonds ... 32–34, 46
New Mexico, district law ... 6
New Mexico Association of Soil Conservation Districts, formation ... 222
Newspaper—
bi-lingual ... 245
conservation publicizing ... 221
NIXON, W. M.: Hairy Vetch the Versatile ... 154–156
NORMAN, N. PHILIP: Tomorrow's Food. With James Rorty. Reviewed by W. A. Albrecht ... 22, 23
Northeast, conservation sped by guides. O. C. Bruce ... 137–139
NORTON, R. A.: Wind blowing and plowing in Iowa ... 45
Norway, soil erosion ... 260–264
Nurseries—
conservation, planning ... 14–16
successes ... 248

Oats, Arkansas Traveler, growing. J. A. Killough ... 268

Page

O'Brien, Washington R.: Flying Farmers Wing Across District ---- 7–10
Off to right start. Arthur D. Slavin ---- 12–16
Ohio University, Athens, Conference, notes ---- 66–68
Ol' Man River, halter ---- 257–259
O'Neill, Charles T.: A Banker Looks at the Land ---- 217–219
"Opening of the Second Frontier" ---- 132–134
Orchard—
  improvement ---- 71–72
  irrigation ---- 150
  soil requirements ---- 255–256, 259
Organic matter, need ---- 255–256, 259
Outlook—
  conservation ---- 41, 237–239
  livestock and meat ---- 216
Owner-operators, problems ---- 99–100
Owners, search for light on land. Guy C. Fuller ---- 179–180

Page County, Iowa, Soil Conservation District, nursery planning ---- 14
Pakistan, visitors from ---- 231
Pastures—
  cost and value ---- 232–234, 240
  green, sought in Arizona ---- [194], 205
  improvement ---- [98], 168
  irrigation in Colorado ---- 246
  plantings on land utilization projects ---- 158–161, 168
  preferred to swamp grass ---- 223
Pensacola Bahia, tests on land utilization projects ---- 159–161, 168
Pinchot, Gifford: Breaking New Ground. Reviewed by John Keller ---- 190
Pine, loblolly, planting in South Carolina ---- 114–115
Plan on every farm. Herbert R. N. Boddy ---- 3–6
Plane, view of land. E. V. Jotter and S. C. Hartman ---- 165–167
Plant nutrients in soil ---- 67
Poe, Elizabeth J.: Water Problems in the Southwest ---- 142–144
Pond, farm, for multiple use ---- 247
Ponds—
  farm, fish failure ---- 272
  farm, in Arizona ---- 190
  storage, in Utah ---- 270
Postlethwaite, Hermann: Harvesting Blue Lupine Seed ---- 200–201
Potatoes, contour production ---- 247
Poultry—
  farm, improvement ---- 264–265
  farming on contour ---- [210], 220
Production increase from farm planning. O. J. McDougal ---- 116–118
Progress, decade. R. W. Rogers and H. C. Fletcher ---- 35–41
Putman, O. L.: 4 Years' Transformation ---- 112–113

Quail food, bicolor lespedeza ---- 6

Rabbits, spread of juniper ---- 205

Page

Raindrops and Soil Erosion, film revised ---- 96
Rainfall, equalization ---- 267
Ranch—
  cattle ---- 246–247
  run-down, restoration ---- 208
Ranching—
  frontier, by the Skagit. Herb Boddy ---- 227–229
  with aerial land-use map ---- 211–212
Range—
  farming, success ---- 220
  fire fighting. Ross D. Davies ---- 198–199, 204
Redman, William, honor award ---- 202–204
Ree wheatgrass for northern Great Plains ---- 242
References, conservation. William L. Robey ---- 23
Reservoir, irrigation ---- 246
Reservoirs, use on drained land ---- 128
Residues, crop, service to two farmers. C. Wallace Buck ---- 177–178
Reviews—
  Breaking New Ground. Gifford Pinchot ---- 190
  Farm Management. Black, Clawson, Sayre, and Wilcox ---- 68–69
  Heaven's Tableland. Vance Johnson ---- 206
  The Earth Is Ours. Marion Pedersen Teal ---- 264
  The Land and Wildlife. Edward H. Graham ---- 47
  Tomorrow's Food. James Rorty and N. Philip Norman ---- 22
Richwine, Hugh K.: New Grass Fills Gap in Northern Great Plains. With A. D. Stoesz ---- 241–243
River banks, protection projects ---- 257–259
Robey, William L.: References ---- 23
Rogers, R. W.: Decade of Progress. With H. C. Fletcher ---- 35–41
Rork, Charles F.: Many Hands Build Granite Creek Diversion Dam ---- 140–141, 144
Rorty, James: Tomorrow's Food. With Philip Norman ---- 22, 23
Rotation—
  corn growing ---- 152
  report ---- 204

Sagebrush slopes, conversion to grass ---- 192
St. Joe River Soil Conservation District, Mich., flying tour ---- 7–10
St. Louis Farmers' Club, instruction ---- 195–197
Sauvie Island Soil Conservation District, planning ---- 3–6
Scandinavia, soil erosion. Vernon Hahn ---- 260–264
Schools—
  conservation studies ---- 30–31
  teaching conservation ---- 171–173, 180
Scott, L. B. Grasses and Legumes Tested on Land Utilization Projects. With R. Y. Bailey and L. J. Leffelman ---- 158–161, 168
Shelterbelt, aid to corn growing ---- 266
Shuhart, Donald V., mission ---- 245
Six or eight heads better than one. Glendon P. Burton ---- 78–80
Skagit River country, ranching. Herb Boddy ---- 227–229
Slavin, Arthur D.: Off to the Right Start ---- 12–16

Page

Slide rule, production and use. Walter S. Atkinson 265
SOBOLEV, S. S.: Protecting Soils in the U. S. S. R. 17–19
Soil—
conservation districts—
property owner 221
total acreage [50]
organization 35–36
erosion. *See* Erosion.
good care, response of yields to 81–83
group 3, description and treatment 138
importance [122]
improvement by vetch 154–156
living, talk of. Morris E. Fonda 66–68
map, advantage 255
means of postwar reconstruction 254
plant nutrients 67
salvage on rented farms. I. W. Arthur 85–87
save and save all. John A. Cleaton 83–84, 95
sleep under fodder blanket. Wellington Brink 149–151
sowers, and church. Ray F. Magnuson 174–176, 180, 190
stewardship 137
types, Virginia 266
See also Conservation.
Soil Conservation Service, establishment 35–36
Soils—
live, rich in humus. Grover F. Brown 255–256, 259
practical management, instruction 147–148
protection in U.S.S.R. S. S. Sobolev 17–19
Southwest, water problems. Elizabeth J. Poe 142–144
Sowers, soil, and church. Ray F. Magnuson 174–176, 180, 190
Stocking and grassing 192
STOESZ, A. D.: New Grass Fills Gap in Northern Great Plains. With Hugh K. Richwine 241–243
Stream-control projects 257–259
Stubble—
and rotation, value 192
management 271
mulch, prevention of erosion 177–178
Students, Indiana, top choice. B. R. Bertramson 217
Sweden, soil erosion 260–264

Teaching conservation to children 171–173, 180
TEAL, MARION PEDERSEN: The Earth Is Ours. Review by W. A. Albrecht 264
Techniques, correct, results 86
Tenancy, role in agricultural economy 100
Tenant, compensation for unexhausted improvements 102–103
Tenure—
land, for soil conservation. E. C. Weitzell and M. M. Tharp 99–103, 107
relationships, improvement 100–103
Terraces—
and contouring 205
built by faith and hard work. Dale Jaedicke 91–92

Page

Terraces—Continued
diversion 248
value 139
THARP, M. M.: Land Tenure for Soil Conservation. With E. C. Weitzell 99–103, 107
THORNTON, ROBERT B.: District Profile: Kent Leavitt, Top Man 130–131
Threlkeld, A., district profile. John McKinney 20–21
Tile drainage. *See* Drainage, tile.
Timber, management profits 251–252
Tomorrow's food. James Rorty and N. Philip Norman. Review by W. A. Albrecht 22–23
Top award to Ohio farmer 202–204
Tree growth, correspondence to land class 115
Trempealeau schools, view of land. Jack P. Dundas 30–31
Truck crops, soil requirements 255–256, 259
Tulia—
great records. Paul H. Walser 181–184
Tex., honor awards 165, 181–184
Twenty acres. J. A. Killough 75–77
Two farms remade between dawn and dusk 132–134

U. S. Army Engineer Corps, work 212

Van Buren Soil Conservation District, flying tour 7–10
Vegetable production, soil requirements 255–256, 259
Vetch, hairy, versatility. W. M. Nixon 154–156

WALSER, PAUL H.: Tulia Outdoes Itself—Follows One Great Record With an Even Better One 181–184
Washington areas, successful practices 220–221
Water—
disposal systems, slide rule for. Walter S. Atkinson 265
problems in Southwest. Elizabeth J. Poe 142–144
put to work. Wellington Brink 123–129
Waterlogging, eradication 142–144
Watersheds—
drainage 184–189
experimental 152
Waterways—
function and types 184–185
grass seeding 188–189
grassed in Kansas and Nebraska. Ira K. Landon 184–189
WEAVER, MARION H.: Once-Flooded Land Yields Bumper Crop 253–254
WEITZEL, E. C.: Land Tenure for Soil Conservation. With M. M. Tharp 99–103, 107
Well, irrigation 168
West Fork Soil Conservation District, W. Va., work 78
Wheatgrass for—
erosion control. Hershel M. Bell 267–268
northern Great Plains 241–243
Wildlife—
and land. Edward H. Graham. Review by Rudolf Bennitt 47

	Page
Wildlife—Continued	
on farms	167
plantings	248
Willow Grove, drainage. Herbert Boddy	162–163
Wilmington Bahia, tests on land utilization projects	159–161, 168
Woman rancher, use of aerial map	211–212
Woodland management	251–252
Woodlot, farm profits	226
Woods, cash in. Herbert Boddy	251
Wrapping paper, instructions on conservation	47
WRENCH, G. T.: Reconstruction by Way of the Soil, quotation	254
Yields, response to good care of soil	81–83
Youth, observations on farming	219

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